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ABSTRACT

As one of a series of team reports directed at knowledge building in the realm of non-formal education, this report presents three separate papers dealing with the economics of non-formal education. This report constitutes the final statement of a team of faculty members and/or research fellows. Titled "Economic Analysis and Non-Formal Education", the first paper is an essay dealing with the methodological problems of applying economic theory to non-formal education and addresses the problems of cost-benefits and rates of return, the unique characteristics of non-formal education, and the rural sector. The second paper, titled "Measuring the Cost of Non-Formal Education", outlines the shortcomings of present cost analyses of non-formal education and, suggesting how such cost analyses could be conducted in the future, proposes field tests for three forms (estimating costs of vocational training for youth, distribution of government costs by agency and level, and number of students). The final and most extensive paper constitutes a state of the arts review, including an introduction and summary and the following chapters: "Towards an Economic and Social Theory of Non-Formal Education"; "Investment Criteria in Non-Formal Education"; "Application of Investment Criteria and Non-Formal Education"; and "Planning, Growth, Development, and Non-Formal Education". (JC)

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ED127107

Program of Studies in Non-Formal Education

Study Team Reports

Economics of Non-Formal Education

John M. Hunter
Michael E. Borus
Abdul Mannan

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Program of Studies in Non-formal Education

Team Reports

ECONOMICS AND NON-FORMAL EDUCATION

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FOREWORD

The Michigan State University Program of Studies in Non-formal Education, made possible by the Agency for International Development, has two primary objectives: to build a systematic knowledge base about non-formal education, and to apply knowledge through consultation, technical assistance, workshops, and the distribution of useful materials in developing areas of the world.

This series of Team Reports is directed at the first objective, knowledge building. The series consists of the final statements of nine teams of faculty members and research fellows, each working on a separate aspect of non-formal education for a substained period of time. The reports range widely over non-formal education. They deal with its history, its categories and strategies, economics, and learning. Other reports made comparisons among country programs, survey case studies, examine the feasibility of designing non-formal education models, look at administrative alternatives and draw plans for participant training in non-formal education.

The teams were cross-disciplinary in composition, representing such areas as economics, labor and industrial relations, political science, public administration, agricultural economics, sociology and education. Together, members of the teams produced nearly one hundred working papers, many of which were shared and debated in three series of semi-weekly seminars for all project participants. The working papers, copies of which are available upon request, provide the basic ideas for the reports in this series.

In the interest of the freest possible exploration each team was encouraged to range widely over its domain and to develop its own set of conclusions and recommendations. Coordination was achieved through the common seminars and the exchange of data and experience. A summary volume, pulling together and synthesizing the main thrusts of all the team reports in this series, is being prepared under the editorship of Marvin Grandstaff. Like the working papers, the summary volume will be available for distribution.

In line with our first objective (knowledge building) the papers in this series are conceptual in nature. In the pursuit of knowledge, however, we have tried to keep one question steadily before us: what assistance does this knowledge provide to those whose primary concern is with action--the planning and implementing of non-formal education at the level of practice? That question isn't easily answered. At best our knowledge is partial and it needs the experience demension to make it more complete. For thought and action are not antithetical; they are necessary complements. One of our hopes is that this series of team reports may help to stimulate further dialogue between those who approach the subject of non-formal education from a conceptual point of view and those whose questions and problems arise in the exigencies of practice.

What is the role of non-formal education in future development planning? As these reports suggest, it is probably great, and will be even greater through future time. The limitations of formal schooling are coming to be better understood. As the Faure report concludes, the schools "will be less and less in a position to claim the education functions in society as its special perogative. All sectors-public administration, industry, communications, transportation must take part in promoting education. Local and national communities are in themselves eminently education institutions".

The non-formal education component of most societies is strong, indeed frequently vigorous, and fully capable of further development and use. It is estimated that roughly half of the present educational effort in the developing countries is in the non-formal sector. Collectively, these programs exhibit characteristics indispensible to development. For example, they tend to arise in response to immediate needs; they are usually related to action and use; they tend to be short term rather than long; they have a variety of sponsors, both public and private; and they tend to be responsive to local community requirements. More importantly non-formal education shows strong

potential for getting at the human condition of those must likely to be excluded from the formal schools, the poor, the isolated, the rural, the illiterate, the unemployed and the under-employed, for being carried on in the context of limited resources, and for being efficient in terms of time and cost.

Clearly, attention given to designing new strategies for the development of this old and promising resource is worthwhile. Through this series we seek join hands with others who are attending to the development of non-formal education.

Cole S. Brembeck, Director
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College of Education
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East Lansing, Michigan
March, 1974

PART I

ECONOMIC PERSPECTIVES ON NON-FORMAL EDUCATION

CHAPTER I

ECONOMIC ANALYSIS AND NON-FORMAL EDUCATION*

Introduction

The economic problems associated with education in general and non-formal education in particular are deceptive in that they appear to be simple. In essence, they are not different from other problems of investment,[1] and economic theory has been clear on the major elements of investment criteria for a century or so. But there is a notable paucity of solid, definitive empirical work regarding investment in education. If the theory is indeed sound, the scarcity must stem from either a lack of interest or in methodological problems with the application of the theory. In recent years interest has been high, and problems of method have been the deterents. This essay will concentrate largely on these methodological problems as they relate to non-formal education.

Elementary theory indicates that one should continue to invest in an investment opportunity so long as increments to it continue to yield higher returns than they would in other possibilities. Suppose this prescription is followed for each alternative until the investment resources are exhausted. Then resources will be distributed among the various possibilities so that the return produced by the last unit invested in each will be equal for all alternative investment opportunities. If this were not the case, it would be possible to withdraw some units of low yield and to add them to opportunities where the yield is high, thus increasing the total return. Education in general and specific educational projects fit well into this theoretical construct, and the analysis below will explore the application of this general "rule" for allocating investment resources.

---

*By John M. Hunter.

There are three general levels at which the problem of allocation of resources may be considered and for which the *economizing* questions may be asked. The most general question is asked at the highest level: How much should be allocated to education of the nation's resources in comparison with agriculture? defense? transportation? culture? Public and private resources for education are involved which raises difficult problems for central planners when large segments of educational expenditures are either made privately or at the option of local governments. Decisions, nonetheless, have to be made--consciously or not, wisely or not, rationally or not.

Once resources have been allocated to the education planning authorities, second level decisions must be made: How much should go to higher education? How much to other levels? How much to traditional forms and how much to non-traditional forms? How much to future development such as teacher training, and how much to present "consumption" of educational resources? These questions are essentially intra-ministerial, but the "educational establishment" must also deal with educational activities of ministries other than that of education; and these will surely encompass many of the public non-formal educational activities. Further, it will need to account for activities of the private sector and determine how that sector may be encouraged to fill its anticipated or projected role. This *is* educational planning whether it be well or poorly done, whether it be conscious and formal or haphazard by default. The decisions cannot be avoided--they can only be better-taken or worse.

The "rule" at both these levels is designed to maximize the return from the amount of resources available. Maximization can similarly take place at the very lowest level of conceptualization at which the resources are considered *given*, and the problem is to maximize the "product" or "output" utilizing that given input. This might be at the school or program level; with the resources given and a minimum quality standard for the product described, the problem is to produce the most (or best) product possible with the given resources. This may be considered an "administrative" problem rather

than an "economic" one. Naming the problem is not nearly so important as being aware of it and finding a solution since failure to do so wastes resources, something which no one--but especially the poor--can afford to do.

The matter of efficiency at this level has great significance to the investment "rule" since the rule assumes implicitly that alternative uses of resources utilize them efficiently or, at least, that there is no difference from use to use in the degree of wastefulness. If there is variation, then the rule must be stated in terms of *actual* returns rather than *potential* returns. Thus, the levels described above are not independent of each other. Estimates of returns to various alternative investment possibilities already take into account the level of efficiency found at the project level. This is done by assuming that all resources are efficiently utilized.

These general comments apply to non-formal eduation as a part of education in its competitive quest for funds[2] and as a claimant for a share of funds somehow allocated to education. At the third level and with respect to efficiency, there is, of course, no more reason to justify the waste of funds for non-formal education than there is for any other activity.

Cost-Benefits and Rates of Return

There are two similar techniques of computing returns to education and/or educational projects. These are the familiar benefit-cost ratios and internal rates of return. In the former, if benefits are the numerator of the fraction, then the larger the benefit-cost ratio, the more desirable the project. And one would continue to invest in that project so long as the ratio continued to exceed that in other alternatives.[3] The rates of return approach expresses results not in an explicit ratio but as a rate of return to the investment (cost). It is that rate at which the income stream from the investment would be discounted so that costs and the present value of the income stream would be equal. The higher the rate so computed, the better the project and the greater the

probability that it should be continued as a recipient of investment when compared to alternatives. The results of the two procedures are essentially the same in character so that it is not necessary to examine both techniques separately in great detail.[4] Even though they are similar in character, different ordering of projects may be produced by use of these two techniques. Indeed, even if one utilizes only one of them, choices of technique in treating the variables may alter the rank order of projects.

Cursory examination reveals that two elements are involved in both approaches. An examination of "costs" will be undertaken first to be followed by a consideration of "returns."

Costs

Costs are by far the easier of the two to handle. Costs are of three varieties: explicit and implicit costs, and joint costs. Explicit costs are those which involve actual expenditure for the particular project with which one is dealing. This might be teachers' salaries, books, and others which can easily and *exclusively* be identified with the project in question. Joint costs are those which are inextricably associated with two or more activities. Administrative expenses, depreciation charges on fixed assets such as buildings, the costs of equipment used for production during the day and instruction at night are examples of joint costs. The existence of joint costs depends upon facilities or services *shared*. There will be fewer joint cost problems at the agency or school level since these are the services and facilities which are usually shared. But at lower levels of programs and courses, the joint-cost problem becomes more important since these are the elements which share. Interests in costs in non-formal education will perhaps frequently be at the program level; consequently, the joint-cost problem will be of some importance.

Depreciation of fixed assets and similar costs are joint costs with the sharing of costs not between projects but between time periods. These are not *paid out* to anyone in each accounting

period, but they are real nonetheless and must be accounted for. Joint costs and implicit costs are difficult problems to deal with, and solutions are perforce arbitrary. The temptation is strong simply to leave them out, but this clearly understates the costs.

The most common implicit cost of education is that of "income forgone." Many of the consumers of education have other alternatives open to them while they undertake educational activities. They might have earned income in a job, they might have given up a better job in some other location in order to obtain schooling, and so forth. This element can be ignored for the very young since the alternatives open to them are generally not remunerative, but for youngsters in the Third World who enter the labor force at eight, ten, or twelve years of age, income forgone both for them as individuals and for their families may become much more important at these ages than we are apt to consider it. Treating income forgone in non-formal education is especially important and especially difficult. It is important because the participants of non-formal education are apt to be mature individuals who do earn income; consequently, the concept of forgone income is likely to apply to a high percentage of the participants. It is especially difficult to handle because of both the heterogeneity of programs and of participants. Furthermore, there is the possibility of income forgone (production) by the employers if the non-formal experience is on-the-job.

We need also to distinguish between "social" costs and "private" costs although the distinction between social and private *returns* is much more important and will be examined below. Private costs are those payments necessary to attract resources to do particular tasks; social costs are what society gives up in having resources involved in doing particular tasks. In a neat world, where resources would be paid the value society puts upon them, there would be no difference between the two. In a few cases in education, the difference between social and private costs exists and may even be important. Suppose private schools are parochial and manned by priests and nuns. These teachers are remunerated by their orders so

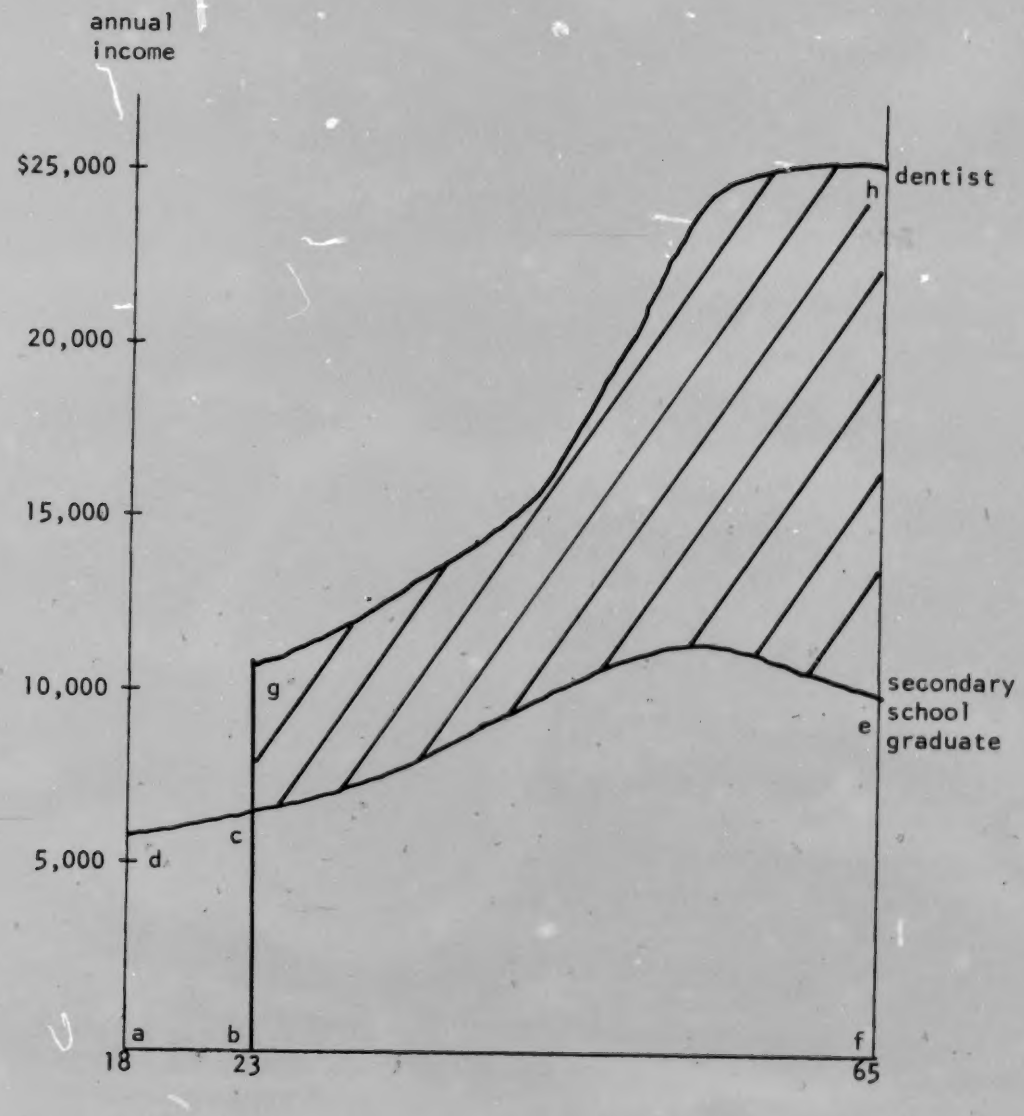
as to provide them with subsistence levels of consumption and little else. This maintenance is the *private cost* of these resources, but the cost to society is at least what comparably trained human resources could command in a free market. Utilizing only private costs in these circumstances would grossly underestimate the cost of the education. For the most part, though, this is no real problem--especially compared to the problems of treating the disparities between social and private returns.

Benefits

The denominator of the benefit-cost ratio is much more difficult to manage mostly because of operational difficulties in measurement. At the outset, there is a difference between private and social returns, and we will concentrate first on the former.

The prime difficulty in measuring private returns is that of isolating the benefits flowing from a specific educational experience. Essentially, we want to know how much more will an individual (group) earn in the course of his lifetime as the result of an educational experience than he would have earned without having had the educational experience. This is easy to state, but the methodology is another story. "Earnings profiles" are resorted to for this purpose. From records[5] of present earnings of individuals whose ages cover a broad span, future earnings are projected for two groups, theoretically alike in every respect except that one was subject to some definite educational experience while the other was not.

An example demonstrates the technique clearly. This particular one is drawn from a study done in Brazil seeking to evaluate various kinds of higher education. Earnings of secondary school graduates (the control group) were projected from cross-sectional earnings data, and the earnings of dentists were similarly projected. These two profiles are juxtaposed in the accompanying diagram. In each case, earnings, are estimated for an average individual in each group from the time he enters the labor market until he retires or otherwise withdraws. The earnings of the secondary school graduate



age in years from entry into labor force until retirement

(hypothetical data)

through his lifetime are represented by the area "adef" and those of the dentist by "bghf." The difference between the two ("cghe") is attributed to the dentist's additional education. Since the dental student begins earning later and since the structure of the earnings through time is different (i.e., the peak for the secondary graduate comes at an earlier age), the two income streams must be discounted (presumably by the current rate of interest) to be comparable. The difference between the present (discounted) values[6] could then be compared to the cost of dental education and a cost-benefit ratio computed. If only the costs of the education to the student are considered, the result is a *private* cost-benefit ratio. If the subsidization of education (i.e., cost to the state) is included, then a social cost-benefit ratio is at least approached. Or, alternatively, the question could be posed, "At what rate does the income attributable to dental training have to be discounted to make it equal to the cost of that training?" The mathematics is a bit complicated but the concept is easy enough; and the result would be an "internal rate of return" for post-secondary, dental education.

There are a number of serious criticisms not so much of the approach but of the techniques one has to employ in order to obtain that ultimate *desideratum*, a datum. These will be examined with special attention to their significance in Third World situations.

1. Most important, this is all reconstruction from the past. The passage of time may make considerable difference. For example, in the case above, estimates for the future are based on current earnings of dentists who finished their training (say) forty years ago. The profile shows earnings peaking at age 60, and this information is gleaned from the present earnings of dentists who graduated when they were about 25 years of age. The extrapolation of information derived from what dentists at various ages now earn to estimate the earnings of the average future dentist through his lifetime is at least heroic. But even worse, of interest to the Third World are *new* occupations and *new* training experiences in radically different labor markets for which past or even present experience is of no help whatsoever. In

the absence of historical information--even if one were to admit its relevance--new techniques need to be sought and found to substitute for the preoccupation with the manipulation of numbers, any numbers, to seven decimal places--however doubtful may be the results.

There is implicit in the method the assumption that the group of interest and the group of comparison, the control group, are in all respects homogeneous except for the one different application of education. This may or may not be the case; but if it is not, the analysis falls of its own internal weight. If the two groups vary in more than the one element, then assignment of differences in earnings to just the difference in educational experience is not legitimate. Suppose that those ambitious enough to get through dental school are those who hanker effectively for money. Then the analysis may demonstrate only that those willing to work hard enough for money will get more than those who are not--which is a sort of primitive conclusion. This difficulty with the "control group" is probably serious in any case, but it becomes a particularly great problem related to non-formal education. Non-formal education may be experiences by the individual in small, discrete, and multiple doses. In the case of the four-year dental program, this was a massive increment compared to any casual post-secondary educational experiences of secondary graduates, and it could have been reasonable to associate differences in income with the one difference in education. With shorter, more numerous, multiple programs, the problem of identifying associations is much more difficult. Suppose three groups of individuals who have all finished primary school are identified with non-formal experiences indicated by lower-case letters as follows:

Group 1	Group 2	Group 3
a	a	a
b	b	b
c	c	e
d	d	d
	e	c

If earnings are found to be different between groups, can the difference between Group 1 and Group 2 be attributed only to the application of experience "e"? Will the difference between Groups 2 and 3 be attributed solely to the order in which the experiences are applied? Will the differences between Groups 1 and 3 be attributed to the difference in order? the addition of experience "e"? or both? This simple hypothetical example illustrates two points: (1) when the applications are small and multiple, the problem of identifying securely a control group is immensely difficult; and (2) even the intuitive assignment of cause and effect becomes less than certain.

3. This analysis assumes, too, that prices paid in the labor market are determined under competitive conditions or at least that there is no more non-competitive behavior in the market for the sample group than for the control group. The assumption in its purer form is necessary for the wage to be equal to the value of the product of the worker, i.e., so that earnings are an adequate measure of the value of the worker's contribution to society. Consider the case of an apprenticeship experience in some closed occupation, say, meat cutting. Meat cutters through their ability to restrict entry can exercise monopoly power in the sale of services. Observed differences in earnings between a group of "graduated" apprentices and a control group would be attributable both to the educational experience and to the "closed" nature of the occupation. This has particular importance for non-formal education in the Third World because (1) non-formal education has particular relevance to the acquistion of industrial skills, and (2) the role of unions in such economies is frequently to protect skilled industrial workers not against the parsimony of management but against the encroachment (i.e., "competition") of the unskilled masses.

4. Also of considerable importance is the criticism that this analysis is valid for prescribing at the margin. Technically, it can prescribe what should be done with small increments of funds as between a number of functioning projects. It does not tell much about what should be done with large chunks of new funds and how to

allocate them among many new, non-functioning programs. The task of planners in the Third World is just that, though--making revolutionary changes in the large with new approaches and new programs.

The problems of measuring social benefits as compared to private benefits are enormous. For the most part, market prices paid for labor may reasonably represent private benefits although we have already noted exceptions. What the priest may receive in economic emoluments are properly his private returns but are certainly no measure of the returns to society. The earnings of urban physicians as compared to rural physicians are vastly different, but it is doubtful that the social value of their services varies as much. Teachers are frequently "underpaid" according to what they contribute to society and according to the cost of their production.

There are all sorts of social returns associated with general education and with literacy in particular, especially if one values "democracy" highly. A socio-political system which permits the individual to participate actively in the control of the world around him *per se* places a high value on at least a modest dollop of universal education. The individual in such a system must be informed and be able to obtain information through various sources, so the social returns to education are enormous, however incalculable, in proportion as one values democracy. One may speculate from its behavior that the Latin American oligarchy in the first century of its independence must have conceived the social returns (from its *own* point of view) to universal education as having been negative, i.e., as being a threat to the existing pattern of life.

There is now a describable and fairly clear role for education in the process of "development" or "modernization" of Third World economies. The extension and integration of national markets, the expanding size of producing units, the extension of credit systems, the increased roundaboutness of production demands more clerks, accountants, more correspondence, more litigation, more inventory, more anticipation, all of which requires increased skills of more people. This aspect of the subject abrogates the disclaimer of the

first footnote to this chapter. Education may make a positive contribution to development which the market for skills might not recognize and reward. Then, estimating "social returns" would involve trying to fathom education's contribution to developmental objectives and thus trying to put some value on them. To estimate social returns adequately would involve thus a very carefully spelled out theory of the relationship between education and education with some means of putting values on increments of the latter.

Summarizing this section, both cost-benefit and rates of return approaches rely on measuring costs (which is relatively easy although there are some significant problems) and benefits. The latter present very difficult practical and methodological dilemmas particularly with the identification and isolation of the benefits from specific programs. This involves identifying an "experimental" group and comparing it appropriately to a control group. Another major difficulty involves trying to measure social returns and then to add them to private returns. Still other difficulties relate to the need to resort to past experience to project future income profiles when it is emphatically the rupture of the pernicious past and present that is sought. Furthermore, the marginal nature of the calculations and their subsequent prescriptions is still another cogent criticism. The difficulties appear to be, and indeed are, enormous.

The Manpower Approach: A Substitute?

The "manpower approach" is sometimes considered to be a substitute, and a desirable one, for the cost-benefit and rates of return approaches. In some respects, it is an adequate substitute, but in its fundamentals it "solves" the prime problems of the other two approaches by ignoring them. Possibly its principal advantage is that it permits ignoring the fundamental issues and encourages the attack on practical problems which can be solved. Examining this paradoxical or at least ambiguous statement regarding these procedures is the main objective of this section.

The manpower approach begins by asking the question: What are the present manpower resources of the economy in question? And then it follows with: What are the manpower needs of the economy likely to be at some target date? The "problem," then, for the educational community is to move as expeditiously as possible from Situation A to as close as possible to Situation B in the time allowed. This seems sensible enough and straightforward. The task is not uncomplicated, but many of the problems of *choice* seem not to plague the technique as they do cost-benefit and rates of return procedures.

One very desirable aspect of the manpower approach is its demand for an answer to its initial question: Where are we now? The required census encourages focusing on all sorts of appropriate questions: How many are in the labor force? What do they do? What are their ages? What are their skills? How are these skills defined? How are the skills measured? How were they acquired? How much substitutibility is there between various categories of manpower and between manpower and other resources? (E.g., To what extent can unskilled or semi-skilled workers replace skilled personnel? To what extent can manpower replace machines or *vice versa*?) Whatever the approach, the better and more complete the data regarding the initial situation, the more probably will useful results emerge. And the manpower approach seems more naturally to lead to a demand for carefully surveying the current scene than do the other approaches. And the reasons for doing it seem reasonable and even "practical," the latter being of critical importance in the politically economic world in which policy decisions are made.

Further, the manpower approach seems readily adaptable to partial or sub-sector studies. "Industrial workers" can be enumerated, future needs for industrial workers can be estimated, and appropriate devices expanded or developed.

This is not without its problems, however. Information may be given to the educational planners that the agricultural sector is to expand 30 percent in the next decade, the industrial sector by

50 percent, the finance sector by 45 percent, and so forth. To be really meaningful, this information would be much more specific. For example, the industrial sector would be broken down at least into major industrial groups: metal, electrical, petroleum, etc. Someone, either the educationists or the general planners, must specify the technical relationships between these sectoral and sub-sectoral targets and manpower needs. That is, if agriculture is to increase by 3 percent per annum, this implies how many agricultural researchers? how many extension agents? how many rural credit specialists? how many specialists in agricultural marketing? how many tractor mechanics? In technical terms, each sector of the economy can be considered as a special sort of production function with the rate of growth being the output considered. Each of these production functions will have several inputs; for most of them, some indirect educational input will be included in the form of increments of trained or skilled human resources. This educational input, or better, "the various educational sub-inputs," will be described in terms of numbers of people with specified skills or knowledge to be employed at certain dates. This schedule of "educated" or "trained" inputs into the nation's various production processes will be in essence the outputs required of the educational machinery of the nation. Making the situation even more complex, within some limits educational inputs in the production functions for each sub-sector are probably substitutes for other factors and with the educational list of outputs, one "product" may be substituted for another within some limits.

This is a real world problem although it may be dressed up in analytical terms: increasing output in any sector will require increased inputs of the human factor. In some cases, improved quality may be required; in others, improved quality may substitute for quantity. The general planning establishment may estimate the technical coefficients (i.e., how many of each kind of input is required per percentage point increase in each output) and tell the educational establishment how many of each specific type of human

resource to anticipate producing in each of several time periods. Alternatively, it may inform the educational establishment of the output targets for goods and services and leave the Ministry of Education (or whatever) to do its own estimating of the kinds and quantities of educational outputs required. The task--whoever has the responsibility--is no easy one.

Once it has been specified that different quantities of several varieties of labor are required, then programs can be developed, costs estimated, resources budgeted. If the resources supplied are not equal to those "required," then priorities have to be established with decisions made either not to produce all items or to do less than an adequate job producing all or some of them--e.g., it may be decided that it is better to have 10,000 seventy percent competent engineers than 5,000 entirely competent ones. At this point, the problems of "administrative efficiency" become critical since most of the questions of "allocative efficiency" have either already been solved or taken care of in some other way.

This brings us back to the central hypothesis of this section--the illusory nature of the differences between the manpower approach and the two approaches discussed earlier. The balance for most practical exercises seems cast entirely toward the manpower approach, so it is worthwhile to examine the relation between the two. In general, cost-benefit and rates of return are concerned with allocative efficiency: how many resources should be devoted to this, to that, and to the other--based on the comparative costs and returns from alternative uses of resources. These are critical social questions and chronologically the first to be encountered and to be dealt with. The manpower approach takes as "given" most of the answers to allocative efficiency questions. That is, when most of the manpower questions are raised, it has already been decided on some basis or other that the glass industry ought to expand, that the buggy industry ought to be contracted, that transportation by air should expand, that sugar should contract but that soy beans should be expanded. Given all this, it is realtively easy to proceed on a manpower basis

to provide the training, fill the holes, follow the plan. Upon consideration, it becomes clear that prior decisions regarding sectors to be expanded, contracted, and so forth are made (consciously or not) on the basis of some cost-benefit calculation, e.g., "more resources should go into power generation since that is where we will benefit most." Thus, the two are seen to be not substitutes for each other but rather to be successive step approaches or "different level" approaches. Perhaps the most important implication of this is that there is no way one can be "shed" of the allocation questions by deciding to "adopt" the manpower approach as opposed to the cost-benefit or rates of return approach.

Unique Characteristics of Non-Formal Education

Nearly all of that that has been said above applies to education in general as well as to non-formal education. This section will turn specifically to examining non-formal education and the special problems it has and advantages it offers. For these purposes, non-formal education is regarded as a variegated set of educational experiences planned and consciously delivered by someone or agency, heterogeneous with respect to participant age and entry requirements, sponsorship, delivery agent, instructional method, duration, intensity, official recognition, material offered. In general, it is specifically vocationally oriented with the major exception of literacy training.

Perhaps it is an advantage that non-formal education requires that the investigator begin by looking very closely at measurement techniques. At once it becomes apparent that the standard technique of measuring efficiency in education is denied him: he cannot sensibly divide total costs by some unit of *input* to obtain an average cost per unit of *output*. This is what is done when costs are divided by the number of students (an input) to obtain costs per student. This uses an input as a dummy for output. For standardized, formal primary and secondary school situations, the procedure has some legitimacy providing it is used knowingly and with care. What makes the procedure legitimate is the implicit assumption that passing a

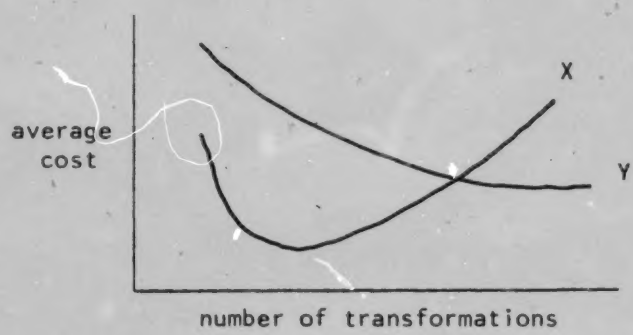
youngster through one year of school has some average educational result, standard throughout the system and well recognized (whether it is or not) by everyone. Then it may be possible to compare efficiency as between schools on the basis of costs per student-year. We are quick enough to recognize that this is no longer applicable at the university level where a reasonable cost per student-year in economics is no more than equal that of cost per student-year in medicine than is the level of the salaries of professors in the two academic sub-units.

Education, as I see it, is the process of transforming a person or set of persons from some defined initial situation to some defined intermediary or final situation. It is this transformation and efficiency in bringing it about that causes the measurement problem. At the outset, the fact of a student's mere presence is not a very good measure of the transformation one is seeking to measure.

This becomes particularly a problem in the case of non-formal education because most experiences are not standard ones. It is neither possible nor legitimate to start with the assumption that "participant hours" or "participant years" is any measure of what is accomplished. To do so would beg the question of measuring output. Furthermore, the student or participant is far from the standard he tends to be in the usual formal schooling situation. He may be a common laborer; he may hold the highest university degree. He may have had little schooling prior to the non-formal experience; and he may have had all sorts of other non-formal experiences. The program may last a month; it may last several years. It may be on-the-job in which case absence from production may be a cost to the employer; it may be off-the-job but while the worker is fully employed. In that case, what, if anything, is "forgone" and how is it to be "costed out?" Is the participant's "leisure forgone" not to be valued in some way? The objectives may be well defined as that of training non-skilled workers to be "lathe operators' helpers," or they may be defined specifically enough in terms of making persons "functionally literate" leaving the use of this transformation

and its value not too clear. This is the critical point: There is no convenient shortcut in non-formal education as there may be for some purposes in formal education for the measurement of output. Non-formal education is forced to define very clearly what it is trying to do and then to measure its results if there are to be any answers to questions of efficiency and return. This is at once an advantage and a disadvantage.

The purposes of non-formal education are usually narrower than those of formal education, however poorly the latter might be defined. The narrower the definition of objectives and the more clearly they are laid out, the more nearly it may be possible to make some meaningful measurements of educational outputs. This may be the result of testing in the case of skills learned or the formal qualification for some particular job--providing the latter is not simply a device to restrict entry into the profession or occupation in question. It may then be possible to describe a series of alternative systems which start with persons with a set of characteristics, S, and with them perform some transformation so that they finally have a set of characteristics, T. With skill and good luck, each of these alternative systems could be costed "over the relevant ranges" so as to permit comparison of the alternative systems as to "efficiency." The phrase "over the relevant ranges" is to emphasize the possibility of the effects of size in different delivery systems. The following graph illustrates the possibility that may exist in which Program X would be cheaper than Program Y over a considerable range but become more expensive as the number of transformations to be produced increases.



This suggests that the selection from among alternative "transforming" systems may not be entirely unambiguous.

Further, the careful need to describe the initial and terminating sets of characteristics is emphasized. Inputs of individuals will not be homogeneous but ought to fall within a fairly small range of variance with the meanings of the variance understood. An optimal training program for producing lathe operators, say, from seventeen-year-old youths picked up off the farm would possibly not be the same as one designed to produce lathe operators from unskilled but experienced factory workers within a single plant. Both groups might complete the programs with a set of characteristics T but they might have started with sets of characteristics S_1 and S_2 causing the programs to have rather different educational tasks. Or, it might be that two identical groups may be trained as lathe operators--one to do a limited number of operations by rote and the other to do the same operations but with an understanding of the process, knowledge of maintenance of the machinery, capacity to suggest improvements, etc. This stresses perhaps the obvious that perpetrators of these sorts of output measurements are not without a few sticky problems of their own and ought to handle the comparisons of efficiency as between programs with a fair amount of care and understanding.

There is no great difficulty in making comparisons between alternative means of producing a *homogeneous* product. With appropriate information and/or time to develop it, alternatives can be ranked in order of "cost effectiveness." Whether one wants to call this "economics" or "administration," much can clearly be done here by specialists in developing data, requiring clear statements of objectives, developing measurement criteria and tools, etc., so that the society can get more from the resources it dedicates to the purposes in questions.

But this is of no help, to come back to our earlier theme, in answering the question of whether society should produce lathe operators or automotive mechanics. It helps little, either, to be told that it costs three times as much to produce one compared to

the other. And it is not definitively helpful to be told that the more expensively produced specialist earns four times as much as his counterpart. If we want finally to make comparisons between programs to produce mechanics, lathe operators, watch makers, farm managers, and so forth, then there is no alternative but to put *values* on each. Present market values serve some useful purposes, but we produce for the transformed future; and those market values may also vary considerably in private returns as opposed to social returns. This reraises all the problems of valuing benefits and returns.

One of the frequently cited pitfalls of evaluation in formal education is that of distinguishing between expenditures for education as "investment" and those as "consumption." A course in French may provide a lifetime of pleasure to one student who uses it to enjoy French poetry. The same course taken by another student might enable him to become a productive export-import house manager. The former case represents expenditure by the society for "consumption," and the latter is "investment" in the sense that it adds directly to the nation's productive capacity. Much of traditional education is a mixture of both although precise determination of the ratio is not possible. But the issue is an important one in formal education since "investment" expenditures have positive growth and developmental implications while "consumption" expenditures are at best neutral.[7] Non-formal education seems to be without large elements of this particular problem. As we envisage the latter, it is largely job-, skill-, task-oriented (although it need not be), and the major elements are "investment" with little expenditure for "consumption" in the sense employed here.

Finally, there is abroad the notion that non-formal education can be an inexpensive, pervasive substitute for formal education and that perhaps it will serve as some sort of panacea for the human resources problems of the developing world. "The Third World countries cannot afford universal, traditional education; therefore, there must be some sort of substitute. *Voilá*, non-formal education." This is

perhaps overdrawn to the extent of setting up a straw man, but the view warrants three brief comments:

1. One may argue that the formal educational system and its administration are inappropriate and, furthermore, incapable of reform. Then, it *may* follow that a substitute system should be developed. There is considerable probability, however, that the centralization and massification of the substitute system would subject it to the same political and bureaucratic processes as the formal system and would point it toward the same ossification.

2. Non-formal education is generally not viewed as a real "substitute" for the formal structure but as an appendage or supplement or a substitute at the margin. It is entirely possible that the non-formal alternatives are more effective in providing some services, but this is a far cry from arguing that because non-formal education is more effective in some activities it should be more effective in all. And non-formal means may be better ways to produce lathe operators in a population were functional literacy skills are already present than more traditional means, but this does not argue either that all the tasks of education are better performed by non-formal education. The formal, traditional educational mechanism is designed--if for nothing else--to capture advantages of the economies of scale. Curricula are standard, teachers are produced (usually with much less formal education than we require) in standard curricula, texts and syllabi are used nation-wide, pupils are kept within some ranges of standardization by age-specific requirements and entrance exams at various levels. This can be (and doubtless is) overdone, but the fact is that traditional patterns everywhere are partly the result of a search for *efficiency* especially when measured in terms of costs per pupil. The fact of poor programs, rigidity, and other ills does not negate the potential gains from size. Much of that we see desirable about non-formal education is found in dynamic programs, flexible and unique, stressing innovation and reform. Desirable as these may be, these characteristics tend to be those of relatively small, special purpose programs building on the base already

established by the traditional system. This does not argue, incidentally, either that formal education is efficient or that non-formal education is inefficient. But it does argue that non-formal education as a supplement to the formal structure is quite a different activity than it would be were it assigned all the tasks of the formal system.

3. The prescription that non-formal education ought to be substituted for traditional education is a narrow one, and particularly a narrow economic one. Its principal defect is to overlook the social returns related to participatory democracy and the necessary role education must play in providing the bases of democracy. The spirit of the nation as a community, the sense of belonging, the notion of commonality of history and of destiny, and the competence necessary to participate in social decisions are perhaps the most valuable products of the school (however badly they do their jobs). These are imponderables, impossible to value and measure, but this does not deny their existence nor suggest ignoring them. Truly alternative educational devices, if they are to be substitutes, ought to seek ways of satisfying these values as well as the more easily treated specific ones usually associated with non-formal educational projects.

The Rural Sector

It is certainly easiest to discuss non-formal educational matters in terms of job-oriented vocational-type educational activities of the modern sector. There are good reasons, though, to turn attention to the rural sector since it encompasses the mass of people and especially the mass of the destitute.

In the abstract, economics has essentially the same message for this sector as for others, but the practice becomes more complex, depending very much on what one imagines in considering non-formal educational programs in rural areas.

In all probability the ties of "benefits" to some single, measurable variable will be much less clear and demonstrable. A worker with certain skills receives a differential wage in the

industrial sector; but the peasant receives benefits (to say nothing of "social" benefits) in a much more obscure fashion for a number of reasons. First, most agricultural worker-employees are not highly specialized and acquiring a single new skill would be one new string among many on his bow, the compensation for which would be difficult to distinguish. There may be exceptions to this in a few cases of plantation labor, but the general notion seems reasonable. The industrial worker, on the other hand, tends to be specialized, and his skills tend to be hierarchical and replaceable rather than complementary. Second, most peasants are not compensated in *money wages* and the structure of the earning system is little described and understood. Ultimately, earnings depend on what is produced and sold. These sales may be made in monopolistic markets, thus reducing the usefulness of product price in measuring "social benefit." But tenancy provisions, monopsony in the agricultural labor market, payment in kind and/or in permitted use of *hacienda* lands further separate the actual compensation of the peasant from the product produced and sold. This suggests that increasing agricultural productivity is not necessarily enough; for the benefits may accrue to the urban society, the landed, or to middlemen depending upon the market structure and institutional arrangements. Even the rare case of the owner-operator, commercial-farmer peasant who sells in a relatively competitive market[8] would present much more difficult problems of "return" or "benefit" estimation than the case of the skill-compensated industrial courterpart. The whole range of skills, techniques, and knowledge is always brought to bear in an agricultural enterprise, and the effect of change in any one of them is difficult to isolate.[9] The owner-operator, *subsistence*-farmer peasant presents other problems--particularly those of record keeping and measurement.

One can easily envisage a multiple-thrust rural development program--one aimed at improved marketing, increased fertilizer use, purer drinking water, improved nutritional standards, and so on. "Costing" such a program would be complicated involving, first,

separating sets of joint costs from several agencies (e.g., Ministry of Health, Ministry of Agriculture, Ministry of Education) and then aggregating the results. Benefits would be even more difficult to measure (e.g., decreased infant mortality, improved sewing skills among the women, fewer caries, *and* better crops) and, once measured, to put values on.

It is perhaps easier to think of this sort of comprehensive *agricultural* rural program in the large because it lacks the specificity at the local level of a course to train tractor drivers. What effect does this consideration at a national level or regional level have? First, it eliminates or reduces the problems of joint costs: the higher the level, the fewer the problems of jointness although if there are non-related programs some joint cost problems will remain. Second, there may be an illusion that consideration of benefits is easier. But, in the final analysis, benefits accrue (by design) to thousands of individuals on the land and in the villages; aggregating benefits in the nation's capital by estimation really begs the question of benefits rather than answering it.

Suppose, finally, that all these problems are solved and that solid estimates of costs and benefits can be made and that the ratio for a given rural program is smaller than for a modern-sector industrial training program. This is (would be) very valuable information, but it might *not* still be conclusive with respect to an investment decision. If there were a desire to redistribute income to the rural sectors, some additional "social" component might be added to the "private" benefit to reduce the rural cost-benefit ratio to some desired level. The size of this component depends on political-social values, the objective quanitifcation of which is not possible. One might be tempted to multiply all rural project benefits by 1.5 as an arbitrary expansion factor to give them additional weight in the decision-making process, but the suspect nature of the multiplicand is so great that any widespread use of cost-benefit analysis to reach decisions between specific modern-sector *versus* rural sector programs is not likely to develop soon.

This analysis is discouraging with respect to the immediate use of cost-benefit results to favor or deny on an objective basis investments in particular projects. Even cost effectiveness calculations must be regarded as less than perfect. These difficulties stem from the nature of the envisaged program--joint costs, joint products, and results not quantifiable or not susceptible to valuation. The "economics" has not somehow become worse, but the problem is much more complex. It has been ever thus, and decisions have been and will continue to be made without the benefit of a number as an objective guide. Certainly the discouragement is not to be interpreted that projects should be suspended, discriminated against, or favored because of inability to evaluate them precisely. Nor is the difficulty of the task to be interpreted that efforts to evaluate should be given up. Imagination and a great deal of hard work can tell us much that we do not now know and particularly about the rural sector.

Conclusions

The case for economics has been made as the essay progressed. The principal conclusion is evident: Analytically or in the abstract, economic questions and their answers are at the heart of the very tough questions related to the national allocation of resources *but* performance with respect to empirical responses to the questions falls far short of what might be expected. This is particularly true for developing economies. Further, empirical results become more suspect the broader the question asked. Less certainty attaches to responses to questions concerning the allocation of resources between education, defense, and agriculture than to those concerning the allocation between engineering, medical, and agricultural education. Even better answers can be given for the selection between alternative means of accomplishing a given educational task.

"Developing economies" is stressed in the conclusion above for two reasons: (1) The data required for cost-benefit and/or rates of return analyses are sophisticated and frequently only available in the richer countriess--if there. (2) More important, economic

techniques of measurement rely heavily on the past and apply best for small increments at the margin. "Development" for the Third World countries is *change* in the future and, indeed, radical change rather than marginal. With comparatively good data, with magnificent research facilities and budgets, we are far from having solid answers to many of these questions for the United States as the work of Schultz, Solo, Dennison *et al.* attests.

The *answers* may be poor for want of data and weakness of concept, but the *questions* are the appropriate ones. Those responsible for allocating and administering scarce resources ought always to be engaged in seeking to answer two questions:

1. Why this activity rather than some other? What can society expect from it as opposed to another expenditure?
2. How can we get more "transformation" of a particular kind once resources have been committed to a certain activity?

It is regrettable that economics cannot yet crank out simple, unambiguous answers to the questions posed at the national and inter-ministerial level. Its predictive and comparative tools are simply too weak. This calls for a great deal more research than has been done or even contemplated. Studies at the macro level may now be productive enough to aid decision-making by supplementing intuitive and political criteria, and they yield very valuable by-products in the form of new data and new relationships as they aid the search for better methodology. Most valuable and immediate returns, though, will come from competent, intensive research done on particular projects or programs. These case studies will break out new data, begin to formulate data needs for evaluation so that delivery agencies will be encouraged to develop needed data, better methodologies or evaluation may be evolved, and important descriptive program material may be disseminated. Little by little, this knowledge must be developed and integrated.

Along these lines, it is clear from a search of the literature that very little is known about the scope and effectiveness of non-formal education in the Third World. We know even little about the

identities of the providers of training as a study currently being terminated on a Brazilian topic shows. Attention needs to be given, perhaps first of all, to this census question. Careful attention, then, needs to be given to the problems of good definition and measurement for small enough programs so that the goals can be treated unambiguously and outputs be subjected to measurement. Without measurement of outputs and inputs there can be no evaluation, and unless some systematic means can be found to put those into some common terms (e.g., money values), the critical comparisons between alternative means and between programs cannot be made. There is no good alternative to suggest in the face of the failure of economics to supply requisite answers. I recently heard, though, an unattributed quotation which seemed to be pragmatic and philosophic about the situation: "A thorough description of the educational system of any country will reveal more inefficiency than its government will be willing to deal with in our lifetimes."

Resources have been and will continue to be allocated by societies in the absence of precise methodological indications of "best" solutions. Economics provides a rationality for the allocation of resources but is not yet able to handle with assurance the operational aspects of that theory for an investment so complex as education. It is not the best of all worlds but it is certainly not amiss to raise constantly the questions associated with rationality--even granting that for the time being a great deal of decision-making will of necessity depend little on the formal answers of economic theory and of econometric models. Hopefully, decision-making can proceed with much good sense and solid intuition constantly policed by an observant and responsive political mechanism.

NOTES: CHAPTER I

1. Specifically excluded so far as is possible from the scope of this essay is the perplexing, "external" problem of the relationship between "education," of whatever variety, and "development," however defined.

2. "Funds" is a short-hand expression for "real resources" since it is these which are used up rather than money.

3. It is perhaps wise here to remind the unwary that we are considering cost-benefits at the *margin*. These may be very different from *average* cost-benefit relationships.

4. There are technical differences which are discussed in the literature with each method having some advantages and disadvantages.

5. When such records exist.

6. The "present value" of an income stream is sometimes computed to compare to "present costs" of the project to produce it. If the former exceeds the latter, the investment is "warranted" in the sense it is worth more than it costs, but this gives no clue as to its merit *vis à vis* other projects. The problems associated with this are those of estimating costs and particularly the income stream and those of selecting *some* rate of interest for discounting the income stream.

7. Add to this: education is frequently subsidized by the poor for the rich.

8. So that the assumption is tolerable of prices representing social benefits reasonably well.

9. One can imagine holding everything else constant and "applying" additional fertilizer--estimating fertilizer costs *c.i.f.* and measuring increased output at its sale price (benefits), but this is hardly what I understand by a "rural development" program.

CHAPTER II

MEASURING THE COST OF NON-FORMAL EDUCATION*

> *An important conclusion that emerges from our survey is that non-formal education is less expensive per trainee than formal education* -- James R. Sheffield and Victor P. Diejomaoh, *Non-formal Education in African Development.*[1]

> *Our new and increased activities are likely to fall in . . . the search for less costly education through non-formal training* -- World Bank, *Education Sector Working Paper.*[2]

These two quotations exemplify the generally held opinion that programs of non-formal education are less costly than programs which are delivered through the formal educational system. The purpose of this paper is to demonstrate that while the conclusion that non-formal education is less costly may be correct, the data which has been brought to bear on this question do not substantiate this conclusion. An attempt will also be made to indicate which types of information should be collected if cost comparisons between non-formal and formal education and between various types of non-formal education are to be made. Finally, a research project is proposed which is designed to test the feasibility of collecting cost data using a common format to compare formal and non-formal educational projects.

An Evaluation of a Cost Comparison of Non-Formal and Formal Education

To illustrate the present state of cost data used for comparisons of formal and non-formal education in less developed countries it was decided to examine one of the major case studies from African countries used by Sheffield and Diejomaoh--a program attempting to provide vocationally oriented education in a non-formal setting: the Kenya Village Polytechnics (VPs).

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In a section titled "Cost-Benefit," Sheffield and Diejomaoh make the following statements:

> *One of the chief attractions of the Village Polytechnics is their apparent low cost. According to NCCK (National Christian Council of Kenya) statistics collected in June 1969 annual recurrent costs (discounting boarding arrangements) range from $146 per student per annum to $31 per student per annum. John Anderson's 1970 report, "The Village Polytechnic Movement," gives a rough estimate of cost for a polytechnic of 30 students.*
>
> *This cost of $70 per student per year compares with a cost of $23 per student per year at a typical primary school and costs of between $130 and $150 per student per year at a rural secondary school.*[3]

Unfortunately, this apparently straightforward cost comparison is typical of those used to reach the conclusion that non-formal education is less expensive than formal programs; (1) it makes inappropriate comparisons, (2) it applies an incomplete accounting analysis, and (3) it fails to consider who incurs the costs of the programs.[4]

Comparison of Dissimilar Products

The most important shortcoming of cost comparisons such as that of Sheffield and Diejomaoh is they implicitly equate the products of the programs being studied. When they make the simple cost comparison of Village Polytechnics and secondary schools, Sheffield and Diejomaoh are in effect saying that the product of a Village Polytechnic is interchangeable with the product of a secondary school. Such an assumption is totally inappropriate since the Village Polytechnics are designed to provide their students with marketable skills while the secondary school system is attempting to provide its graduates with a more classical general education. The closest formal institutions to the Village Polytechnics are the secondary vocational schools since presumably both are interested in teaching young men and women to be productive members of the labor force. Even with this modification, however, a closer examination of the students completing the programs and of the curricula provided to them indicates that they are not meant to be substitutes for each other. In effect we are still comparing the costs of apples and oranges.

The ideal Village Polytechnic as presented in a handbook produced by the Ministry of Co-operatives and Social Services is

> *it* [the VP] *aims at giving primary school leavers from that area skills, understanding and values which will make them able to look for money-making opportunities where they live and to contribute to rural development by building up the economic strength of their own community.*[5]

The objective of the Village Polytechnic, then, is to provide students with skills applicable in their own rural areas. Courses that seem to be most prevalent include carpentry, masonry, tailoring, and farming. The skills provided are for a relatively simple technology which does not use sophisticated capital equipment. The general education provided is also quite limited. There are usually courses in English and some mathematics, but only on a basic level.

On the other hand, the students in the vocational secondary schools receive somewhat more sophisticated training. Many will subsequently enter the Kenya or Mombassa polytechnic institutes to receive further training in the mechanical engineering, electrical engineering, or building and civil engineering departments. The education provided in the vocational secondary schools also tends to be more general and less firm-specific (i.e., it has applicability in a variety of different occupations and with a variety of different types of firms) than is true for Village Polytechnic training. Moreover, the education in the vocational secondary schools includes much greater non-vocational training in such subjects as English, mathematics, social sciences, etc. than exists in the Village Polytechnics. Finally, the students in the vocational secondary schools have as their ultimate objective employment in the formal sector of Kenya's economy where the technology is quite advanced and there are relatively high capital-labor ratios.

This brief description of the two programs should illustrate that the objectives of the Village Polytechnic and the vocational secondary school are not the same. In such cases one can only make decisions about the relative costliness of the two programs when one is also evaluating their relative benefits. For instance, it is possible that the greater general education and higher skill level

provided by the vocational secondary school is not necessary to the development of Kenya and, therefore, that there are no benefits to be derived from such additional training. Then one could conclude that the Village Polytechnics are a preferred investment of the society's scarce resources because they are cheaper. If, however, one were to decide that more technically sophisticated and better educated individuals were necessary to the formal sector of the economy while persons with relatively limited amounts of training were needed in the informal sector, one would view the Village Polytechnics and the vocational secondary schools not as alternative sources of training but rather as two independent, necessary types of training. One would then seek to question the cost-effectiveness of each type of training to determine if each was being provided at the lowest possible cost.

Incomplete Accounting

The accounting systems applied to education primarily reflect the expenditures of a particular governmental or sponsoring agency during a given time period. Such an accounting system probably will never include all of the costs that the society incurs in providing education but the Sheffield and Diejomaoh figures appear particularly incomplete. For instance in the area of personnel, as Anderson points out in his paper, the cost figures do not include the salaries of expatriate staff. Yet at most of the VPs expatriates represented about half of the staff. One estimate of the average cost of expatraite staff used by Dorothy Thomas in a survey of educational costs is $5,700 per volunteer.[6] However, since the use of such a cost figure would inflate the cost per student to such a great degree and since the Village Polytechnics will be Kenyanized in the future it seems reasonable to merely increase the figure for staff salaries by about 50% since salaries represent between one- and two-thirds of the overall budget for recurrent costs. The effect would be to increase the cost per student by approximately one-fourth. Likewise these figures include only the payments to persons directly involved with the students but do not take account of the administrative

overhead in the form of program planners, inspectors, and senior administrators.

Calculations of school capital costs for buildings, land, and equipment are very seldom carried out properly in the usual cost comparisons of educational programs. The usual practice is merely to assign capital items to the year in which they were purchased or to amortize the original cost of the buildings. These procedures do not measure the current resource value. If one were to attempt this type of calculation for the capital costs of the Village Polytechnics and the vocational secondary schools, it would appear that the cost of the latter would be considerably more since VPs tend to be held in very simple structures and use relatively unsophisticated equipment for teaching purposes while the vocational secondary schools provide much more capital for their students.

The calculation of costs for the two types of training in Kenya also completely ignores the question of opportunity costs, i.e., the question of forgone production for society and forgone earnings for the students while they are participating in the training program or for persons who may be volunteering their services. It is important to note, for instance, that the Village Polytechnics program tends to run from six months to two years whereas the vocational secondary school program is a three-year program and is being extended to four years of training. To the extent that the Village Polytechnic graduate may go out and earn a living during the period when the vocational secondary school student is in Form 2 or Form 3, there are opportunity costs. On the other hand, the VPs rely on volunteers more to teach and administer their programs. Some accounting should be made for the value of the time which these persons donate.

The calculations also do not account for the cost to the students (and to society) for such things as school uniforms, tools, and transportation to and from school. Finally, although it is not applicable in the two cases that we have used for examples, there may be employer costs when training is provided on the job which must be taken into account for that type of a program.

Distribution of Costs

The third major problem with the type of cost analysis presented in the comparison of the Village Polytechnics and the vocational secondary schools is the failure to differentiate who bears the costs of a program. Just as one can discuss the benefits of education for the individual, employers, the government or society, so one can and should calculate the cost for each of these three entities. In addition, the the case of less developed countries, one may also wish to consider the extent to which national as opposed to donor resources are being used. The importance of knowing the distribution of costs is evident if one considers the differences in the amounts that the students are asked to pay in the Village Polytechnic and the vocational secondary schools. The fees of the students at the Village Polytechnics in 1969 were between $20 and $30 for the year.[7] A comparable figure for the vocational secondary schools was over $60 in 1971.[8] In addition, as mentioned above the Village Polytechnic student studied for at least one year less than the graduate of a vocational secondary school program so that this cost, too, was lower. The great difference in the costs of the two types of education for the students naturally led to a more affluent student in the formal system than in the Village Polytechnics.

Also, obviously when one begins to consider the distribution of costs for different programs of education, the fundamental questions arise: "Who should pay for the costs of education" and "In what proportions should each party pay?" When these questions are made explicit factors such as limitations on the resources which the governments of less developed countries can apply toward education and the need for equality of educational opportunity in these countries may be addressed directly. Likewise, one will become more concerned with the distribution of the rewards from education among the individual students, communities, employers, and society.

The importance of the relative costs is also apparent from the fluidity of the sources of support for education, as can be seen by several recent changes occurring in Kenya. First, the Ministry of

Co-operatives and Social Services has recently begun to assume some of the costs of the more established Village Polytechnics. This aid will presumably allow an expansion behond that which could be attained using only local resources and those provided by the National Christian Council of Kenya. On the other hand, the desire for secondary education has been so high in Kenya that the inadequate number of government-aided secondary schools has been supplemented by Harambee secondary schools. The costs of these schools are absorbed by the students, their families, and the community. An ILO study group estimated that in 1970 these schools accounted for over 40% of total secondary school enrollment.[9] Likewise, in the area of vocational training there is now a movement to form Harambee Institutes of Technology with building going on in several locations.[10]

What Is Needed in Cost Comparisons

The purpose of the preceding discussion was not to denigrate the study by Sheffield and Diejomaoh but rather to illustrate the shortcomings of present cost comparisons and to indicate some of the areas in which the analysis of the costs of non-formal education can be improved. Areas which have been identified as needing improvement are: (1) the determination of who pays the costs, (2) a statement of what items are to be included in cost calculations, and (3) the establishment of a data collection system which will provide comparable data on the costs of various types of programs.

The Distribution of Costs

As discussed earlier, there are a variety of different parties who may bear the cost of non-formal education. These include the society of the country, the government (which may mean either the summation of all government costs or may be broken down into costs for the national, regional, and local governments, and for particular governmental agencies at each level), the local community, donor countries or agencies, employers and, of course, the students. Each of these parties will have different costs from participating in a

program of non-formal education, although there may be an overlap in some costs. For example, the expenditure on salaries may come from the budgets of donor agencies, local or national governments, tuition fees, or a combination of these sources. Regardless of the source, however, the total personnel cost would be a cost to the national society. It should also be noted that the distribution of cost is not fixed so that a policy which raises tuition may raise the cost to participants while lowering the cost to the government.

The Components of Cost

For each of the parties the best measure of the cost of a non-formal educational program is the opportunity cost, i.e., the value of the opportunities forgone due to the educational program. In the case of society the opportunity cost is the value of resources which have been devoted to education but which could have been devoted to alternative uses. For instance, the instructional staff of an educational program constitutes human resources which in the absence of the program could have been used in the production of goods for the society. Similarly, the other resources devoted to the educational program such as buildings, land, equipment and supplies represent resources which in the absence of the educational program could be used elsewhere by the society. So, too, the resources which are expended by the students or by employers in the course of the educational program would be available to the society for other uses were the program not to exist. Finally, the society must include as costs the value of the time of the students and of any volunteers in the program which would be devoted to other productive uses in the absence of their participation in the educational program. We thus have as the social costs the value of the resources in forgone uses which have been devoted to the educational program and these resources include the human resources involved in instruction and administration of the program, the physical capital used up by the program, the resources used to operate the program, the resources students devote to attending the program, and the time devoted to the program by the students and volunteers.

There are many problems in estimating the value of the alternative uses of these resources. Economic theory says that in a perfectly competitive market resources will be distributed among alternative uses in such a way that at the margin a resource will command a price equal to its value in the next best alternative use. According to this theory we could take the salary of the teachers in the program and assume that this was the opportunity cost for the use of these resources. In practice, however, we find that markets, particularly in less developed countries, are not perfectly competitive and that there may be little relationship between prices paid for resources and their value in alternative uses. This would be especially true when we are discussing the government sector. Thus, one must rely on a series of assigned values, of "shadow prices."[11] Unfortunately, this introduces an arbitrariness into the cost calculations, regardless of the manner in which the shadow prices are calculated.

It would appear to be easiest and probably would not be overly damaging if one were to use the actual payments made for the resources as the shadow prices whenever possible. For instance, the value assigned to the alternative uses of a teacher would be the wages, fringe benefits, and other payments to him. Similarly, the value in alternative uses of supplies and services purchased for the program would be assumed to be equal to their price. In the case of capital, however, one would have to estimate the rental value of a similar type of building or piece of equipment or calculate the estimated cost to replace the capital that is being used up during the course of the educational program. Finally, in the case of the forgone earnings of students and volunteers one would have to estimate what would have been their earning opportunities were they not participating in the educational program.

The costs to government, whether it be the national government or one of its agencies, a governmental unit at a lower level, or a donor government is much simpler to calculate in most instances. These costs obviously include the expenditures on personnel and operating costs during a fixed time period from the governmental unit's budget--

which are usually referred to as recurrent cost. The treatment of capital by governmental units is a little more difficult. Since educational programs are continuing one cannot properly assign capital costs to the year in which they are incurred but must amortize them over their lifetime. Furthermore, since inflation is a factor in many less developed countries, it is dangerous to use the original cost of the building as an indication of its replacement cost. An alternative way of looking at the cost of capital to a governmental agency is its value in the open market if it was rented to some other party. Granted, it is difficult to use a school building for much else, but it is possible that there are alternative uses and to the extent that the governmental unit does not receive revenue for these uses, the educational program represents a cost. Finally, a governmental agency needs to be concerned with the additional funds which may be paid to the students while they are in the program and the revenues which are lost because the students or volunteers are working less and therefore pay less taxes. On the other hand, the governmental agency would want to deduct from their costs the amount of any tuition which they received from the students.

The costs to the community are difficult to define. One obvious cost is the contributions which are made to the educational program. These may be voluntary contributions in a form of funds, materials, or services, or involuntary contributions in the form of increased taxes which are levied to support the educational program. In the case of contributions of services or materials rather than funds, shadow prices will have to be assigned. And again, arbitrary assessments of market value will have to be made. On the tax side, again an arbitrary decision will be necessary to determine the extent to which taxes are increased for persons in the local community by the presence of the educational program, a not inconsiderable task.

If an employer is providing training in a program such as in an apprenticeship or an industrial school it will be necessary to calculate his costs, too. Problems arise with the calculation of the employer's costs because in the usual case the students produce a

product for the employer and the value of this product must be subtracted from the employer's expenditures. Thus, we have a calculation which would include the expenditures by the employer for supervisors and instructors for the students, supplies and materials used by the students, any wages and fringe benefits paid to the students, and any overhead or other costs which can be attributed to the teaching process. From these sums would be subtracted the value of the students' output and any compensation which is received for the instruction by the employer from the government or students. One can expect, particularly in the case of private employers, that the net cost to the employer will be zero or negative; i.e., he will usually not lose money from the teaching process. On the other hand, in the case of state-owned enterprises, the state may be making a substantial contribution to education by having its enterprises absorb a substantial proportion of the cost.

Finally we come to student costs. These include his out-of-pocket costs for room and board, school supplies, transportation to school and tuition. In addition to out-of-pocket costs any reduction in his earnings, net of taxes, which result from his being in school should be considered as a cost to him of participating in the educational program. From these costs, however, should be subtracted the expenses which the student would have paid for these same items had he not been in school. Also, any increases in transfer payments such as living allowances and the like should be netted out of the student's costs.

Comparability of the Data

In order to compare the costs of formal and non-formal education and various alternative forms of non-formal education it will be necessary for the cost calculations to be made in approximately the same way using approximately the same estimation techniques for all of the programs to be considered. Presentation of aggregate cost statistics is just not enough as was indicated in the earlier discussion of Sheffield's and Diejomaoh's cost comparison. It is necessary

that each of the educational programs being considered use the same categories of cost and the same procedures to calculate each category of cost for the comparison to be meaningful. To facilitate a commonality in cost estimate data it is necessary to consider the format in which cost data is to be collected. Possible forms for the collection of cost data are presented in Table 1.

Form A presents the various cost components described in the preceding section. Thus, for each of the parties who incur costs we could sum the cost categories relevant to them. This would involve the following arithmetic.

$$\begin{aligned}
\text{Social Cost} &= IA + IB + IC + IIA + IIC + IIIA + IIIB + IIIC \\
&\quad + IVA + IVB + IVC + IVD - IIB - IIID - IVE \\
\text{Government Cost} &= IA + IB + IC + IID + IIIF + IVF1 - IIIE \\
\text{Employer Cost} &= IVA + IVB + IVC + IVD - IVE - IVF \\
\text{Student Cost} &= IIA + IIIA + IIIB + IIIC + IIIE + IVF - IIB \\
&\quad - IID - IIID - IIIF
\end{aligned}$$

In the case of government costs it is also necessary to define where the costs are incurred, i.e., which agencies of the government incur the costs and at which levels (national, regional, community, etc.) are the costs incurred. Form B of Table 1 attempts to find the distribution of the governmental costs presented in Form A.

Moreover, it is necessary to examine not only total cost but average cost and marginal cost per student. This requires information on the number of students in the program, both at its beginning and at its end. This information is collected in Form C. Finally, it should be noted that these forms include only cost data. They need to be supplemented by descriptive information indicating the nature and output of the educational programs being considered so that we do not fall into the trap of comparing dissimilar programs.

TABLE 1.--FORMS FOR ESTIMATING COSTS OF VOCATIONAL TRAINING FOR YOUTH.

Form A.--Total Costs.

Institution:
Trade Taught:

	Dates of Year 1 From: To:	Dates of Year 2 From: To:	Dates of Year 3 From: To:	Dates of Year 4 From: To:
I. Institution Costs				
A. Personnel--Salary, fringe benefits and value of payment in kind made to:				
1. Teachers, group leaders, and other types of instructors				
2. Administrators (principal, secretaries, etc.)				
3. Other institution personnel (janitors, tool crib keepers, food workers, etc.)				
4. Administrators outside the institution (Ministry inspectors, planners, administrators of the program at the regional and national levels)				
B. Operating Costs				
1. Office supplies consumed during school year				
2. Travel by staff				
3. Transportation of students				
4. Room and board				
5. Building maintenance and equipment repairs (general upkeep exclusive of personnel)				
6. Supplies provided by the school to students (metal, wood, etc. used by the students in their work at the school during the current period)				
7. Miscellaneous operating costs				
C. Capital Costs				
1. Buildings (a) cost of building if built now and expected life of the building, or (b) rental value of the building				
2. Land (a) current capital value and current interest rate, or (b) rental value of land				
3. Equipment (a) value of equipment if purchased now and its expected life, or (b) its rental value				

TABLE 1.--Continued.

	From: To:	From: To:	From: To:	From: To:
II. Opportunity Costs				
A. Expected earnings of the students were they not in school during school year				
B. Earnings of the students during school year				
C. Value of the services of volunteers were they to be purchased				
D. Taxes which are not paid because of reduced earnings (1) by students, (2) by volunteers				
III. Student Costs				
A. Room and board (imputed value if provided at home)				
B. School supplies (tools, uniforms, etc.)				
C. Transportation to school and work				
D. Expenses which would have been paid were students not in school (room, board, work supplies, transportation)				
E. Tuition if charged the full amount				
F. Transfer payments received by the students (welfare payments, living allowances, tuition reductions, other allowances which they would not receive were they not in school)				
IV. Employer Costs				
A. Supervisors salaries and fringe benefits for the time they are supervising or instructing the students				
B. Supplies and materials used as part of the teaching process				
C. Wages and fringe benefits paid to the students				
D. Other costs of having students such as overhead for space and equipment				
E. Value of the students' normal output				
F. Payments received as compensation for the training (1) from the government (2) from students (3) other sources				

TABLE 1.--Continued.

Form B.--Distribution of Government Costs by Agency and Level.

Cost Item from Form A	Percentage Paid by Each Agency			
	Agency, Level:	Agency, Level:	Agency, Level:	Agency, Level:
I A 1				
I A 2				
I A 3				
I A 4				
I B 1				
I B 2				
I B 3				
I B 4				
I B 5				
I B 6				
I B 7				
I C 1				
I C 2				
I C 3				
II D				
III F				
IV F				
III E				

Form C.--Number of Students.

	Dates of Year 1 From: To:	Dates of Year 2 From: To:	Dates of Year 3 From: To:	Dates of Year 4 From: To:
Number of students beginning studies during the year				
Proportion of students beginning studies (a) who complete the year (b) who complete the program				
Proportion of students who complete the program who are certified in the trade				

A Modest Research Proposal

The preceding essay has outlined the shortcomings of present cost analyses of non-formal education and has suggested how such analyses could be conducted in the future. The procedures suggested unfortunately have not been field tested successfully. Forms somewhat similar to those presented in Table 1 were used on a limited basis by the author with some success. Problems arose, however, in the use of these forms because the author had to collect the information on an ex-post basis relying on previously collected cost information which had been collected for entirely different purposes and which only provided information on a few of the cost categories which were desired. This problem appears not to have been unique to the author since Philip Coombs in his studies for the World Bank mentions that he also had this problem.

Therefore, it is proposed that the forms provided in Table 1, or improved versions thereof, be field tested in a limited number of non-formal and formal educational programs to see if they may be introduced as an ongoing evaluation tool for these projects; i.e., to see whether if someone will be given the responsibility for the collection of regular information on these costs, may the forms subsequently be used at the end of the accounting period to meaningfully compare the costs of formal and non-formal education. The following research procedure might be tried.

First, it is suggested that these forms be reviewed by a panel of experts in order to identify missing categories. Then instruction forms would be designed describing each cost category and the type of data to be collected. Next, five pairs of formal and non-formal educational projects should be selected. Each pair of projects should be as similar as possible in location, the objectives of the education, and in the types of students. Further, it is probably desirable for the five pairs of projects to be located in different countries to reduce the chance of national institutions affecting the outcomes.

It would be desirable if one person at each project was responsible for collecting the cost data necessary for completing the forms. This person might be a university student who took the assignment as part of his thesis or an accountant. It would probably be better if the person were not directly involved in the operation of the educational program because for such a person his operational responsibilities will probably take precedence over the costing duties. In any case, the person will need to be carefully instructed on his duties and will probably need the aid of a resource person who can answer questions as they arise in order to make the cost collection procedures uniform across projects.

At the end of the year discussions would be held with the project personnel involved in the cost data collection to determine whether the forms were useful and how they might be improved. Finally, if the forms were thought to provide accurate information, cost comparisons would be attempted between the ten projects reviewed and the forms might be introduced on a wider level.

NOTES: CHAPTER II

1. James R. Sheffield and Victor P. Diejomaoh, *Non-Formal Education in African Development* (New York: African-American Institute, 1972), p. 204.

2. World Bank, *Education Sector Working Paper* (Washington, D.C.: World Bank, 1971), p. 19.

3. Sheffield and Diejomaoh, *op. cit.*, pp. 77-78.

4. In addition, examination of the original NCCK statistics indicates that the cost estimates for the Village Polytechnic are incorrectly stated by Sheffield and Diejomaoh; the range of recurrent cost which they present based on the 1969 data is much too broad. In fact, only two of the cost figures which are presented are actual expenditures per pupil, the rest are budgeted costs and in more than half of these the Polytechnic had not even opened when the costs were calculated. For the two institutions where actual costs were reported, the Village Polytechnics at Nanbale and Ndere, the per student cost exclusive of boarding cost were about $128 and $74, respectively. It should be noted also that in Ndere the costs are on an eleven month basis. Source: The National Christian Council of Kenya, "A Comparison of Ten Village Polytechnics in Relation to Five Major Areas of concern," Schedule A, submitted by Donald L. Matthews, dated 22.7.69. (Mimeographed.)

5. Ministry of Co-Operatives and Social Services, *How to Start a Village Polytechnic* (Nairobi: 1971), p. 4.

6. Dorothy Thomas, *Who Pays for Adult Education in Kenya?* (Nairobi: Board of Adult Education, 1971), p. 14.

7. The National Christian Council of Kenya, *op. cit.*, p. 4.

8. Gary S. Fields, "The Educational System of Kenya: An Economist's View," Discussion Paper No. 103, Institute for Development Studies, University of Nairobi, April 1971, p. 13. (Mimeographed.)

9. International Labour Office, *Employment, Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya* (Geneva: ILO, 1972), p. 234.

10. E. M. Godfrey, "Technical and Vocational Training in Kenya and the Harambee Institutes of Technology," Discussion Paper No. 169, Institute for Development Studies, University of Nairobi, June, 1973. (Mimeographed.)

11. For an interesting discussion of shadow prices, see Roland N. McKean, "The Use of Shadow Prices," in *Problems in Public Expenditure Analysis*, edited by Samuel B. Chase, Jr. (Washington, D.C.: The Brookings Institution, 1968), pp. 33-65.

12. To quote from a recent book by Coombs,

> *Most managers of non-formal education programmes, we found, like most managers of formal education, are very budget-conscious but not sufficiently cost conscious.*
>
> *Their failings are understandable, however, for it is often extremely difficult to determine the actual costs of non-formal programmes. One reason is that many of the resources used are not reflected in the financial accounts of the programme . . . .*
>
> *Frequently overlooked are the costs to the participants of the programme . . . .*
>
> *Similarly the total amount of resources allocated to non-formal programmes in a country or particular region is generally difficult to assess because data on expenditures for such programmes are hidden in a variety of financial accounts in different agencies. The same applies to external assistance.*
>
> *It seems clear that all non-formal education programmes would benefit from better cost-accounting and closer attention to their costs.*

Phillip H. Coombs with Roy C. Prosser and Manzoor Ahmed, *New Paths to Learning for Rural Children and Youth* (New York: International Council for Educational Development, 1973), pp. 69-70.

PART II

TRENDS AND ISSUES IN THE ECONOMICS OF NON-FORMAL EDUCATION

By

Abdul Mannan

CHAPTER I

INTRODUCTION

Statement of the Problem: Its Scope and Objectives

The literature concerning investment in human capital, education, and manpower planning frequently touches only peripherally on non-formal education; occasionally it treats it directly. After carefully surveying this literature, it is the purpose of this study to describe and to analyze critically "the state of the art" in the area of the economics of non-formal education. What are its strengths and weaknesses? What is the rationale for the emphasis on non-formal education? On what criteria can investment decisions in non-formal education be made? These are among the questions which will be examined. This focus purposely excludes prime attention to sociological, anthropological, and political facets of non-formal education, even though the significance of non-economic factors in the dynamic setting of development and change is recognized.

The parameter along which the study of education by economists has usually been designed may be summarized through the use of the concept of reward--particularly, reward construed as income, either immediately or eventually. More specifically, we may discriminate at least three ways in which reward (income) may be allocated in relation to education. (Education, in this instance, essentially means employment training.)

1. Reward may be a long-term consequence of non-specific or very comprehensive education. This is the formal schooling model.
2. Reward may be a consequence of short-term, highly specific education. This model may be called "job-training," recognizing that it has several subvarieties. It may take place before or after employment. It may provide income (below the ultimate level) or it may not, and so on.

3. Reward may be co-extensive with education. This is the on-the-job training model.

It should be noted that the emphasis here is on deliberate education, and ignores experimental (informal) education. For the most part, this study focuses on a distinction between formal (1) and non-formal (2 & 3) modes of employment training.

The underlying hypothesis to be examined is that non-formal education can substitute for and/or complement formal education both in more and less developed countries. Formal education is essentially academic (i.e., concerned primarily with abstract conceptualization). An education "gap" results between education and employment before and after the recipient of education enters the job market. Formal education also sometimes reinforces existing social norms such as disdain for manual labor and rural life in general. Formal education, in some countries, encourages migration from rural areas to cities in search for employment where the market is already flooded with the "educated unemployed." Furthermore, formal schooling has not been able to cope with the growth of school-age population. If it can be demonstrated that the integration of formal and non-formal education is possible, it is hypothesized that this integration will reduce the above described problems of a significant degree.

The purposes of the study are:

1. To demonstrate theoretically that non-formal education can substitute for and/or complement formal education.
2. To provide a theoretical analysis for issues such as investment criteria and the strategy of planning non-formal education compared to formal education.
3. To provide policy analysis wherever possible to facilitate decision-making and evaluation.

Non-Formal Education: Its Definition and Scope

Non-formal education is conceptually compared to formal, traditional education which is clear in purpose and means to government planners and educators. Given the formal structure of educational institutions and processes, it is tempting to view non-formal education as a residual.

> *. . . non-formal education, as currently conceived by AID/ Washington, is a shorthand expression for the constellation of human skill and knowledge development processes which for the most part are external to traditional, formal school curricula. An over-simplified view is that it includes educational training activities which normally are outside of the jurisdiction of ministries of education.*[1]

This definition fails to consider the objectives; nor does it consider the characteristics of "consciousness" by the imparter or, for that matter, the learner. It is, nonetheless, a beginning. Kleis and others carried this further as follows:

> *Non-formal education is any intentional systematic educational enterprise (usually outside of traditional schooling) in which content, media, time units, admission criteria, staff, facilities and their system components are selected and/or adapted for particular students, populations, or situations, in order to maximize attainment of the learning mission and minimize maintenance of constraints of the system.*[2]

This definition is more comprehensive but suffers the fault of confounding the product (education) with the mechanism (enterprise and system) without being very specific about the latter. It seems in particular to exclude education or learning received in the family situation unless one presumes that the home/family is an "enterprise" and some part of the ill-defined "system." Unless society is entirely regimented, the economics of learning incidental to family living (i.e., art of speaking, neighborhood living, etc.) is probably not manageable because of the inseparability of both complex inputs and outputs.

Although learning yields

> *knowledge in the form of cognition (perceived, interpreted), and retained information), competence (intellectual and/or motive (skill) and colition (value, attitude, appreciation or feeling based on preferences for acting or reacting) . . .*[3]

a definition of non-formal education need not be so comprehensive as to include all learning other than that attained in formal schooling. Thus, we can say that non-formal education is a conscious effort or an educational policy package within the overall framework of the total educational effort of a given community or state at a particular point or period of time (occurring intra-marginally or marginally in association with, but usually outside, of the formal schools and pre-school

family learning situation for any student population), the objective of which is to add to the total learning opportunities available in both "consumption" and "capital forming" areas. Symbolically, non-formal education can be identified as:

$$N = T - F - I - R$$

where N = Non-formal education (e.g., on-the-job training)

T = Total learning experience

F = Learning associated with formal schools

I = Informal learning at home

R = Residual (learning associated incidentally with exposure to the environment, particularly important but not restricted to childhood).

By "conscious effort," we really mean organization and planning for utilization of resources for out-of-school education. For the purpose of this study, organization and formality of the school system are by no means the same. Organization or planning is needed for both formal and non-formal education. As defined here, formal, traditional schooling is absent in non-formal education. Non-formal education and work experiences are closely related with the former frequently directly contributing to greater skills and higher earnings. Thus it is immediately relevant, motivation is maximized as the link between learning and reward is evident.[4] This is not to suggest that non-formal education should avoid dealing with variables having long-term significance.

Professor Harbison's description is highly pragmatic although he approaches the topic as if non-formal education were a residual:

> *Human resource analysis is concerned with two systems of skill and knowledge generation: formal schooling and non-formal education connotes age-specific, full-time classroom attendance in a linear, graded system geared to certificates, diplomas, degrees, or other formal credentials. Formal education is easily defined. Its administration and control in most developing countries is lodged in a ministry of education; its costs are measurable; and its inputs and outputs are easily identified. In contrast, non-formal education, which is probably best defined as skill and knowledge generation which take place outside the formal schooling system, is a heterogeneous conglomeration of unstandardized and seemingly unrelated activities aimed at a wide variety of goals. Non-formal*

> *education is the responsibility of no single ministry; its administration and control are widely diffused throughout the private as well as the public sectors; and its costs, inputs and outputs are not readily measurable. Non-formal education is, perhaps, one of the most "unsystematic" of all systems, yet in most developing countries its role in generating skills, influencing attitudes and molding values is of equal, if not greater, importance than that of formal schooling. Indeed, perhaps, most of man's development takes place routinely and often unconsciously through learning-by-doing, being instructed or inspired by others to perform specific tasks through association and communication with others or simply by participation in a community or in a working environment.*[5]

But as Harbison expands his thinking into describing non-formal education, it becomes evident that his intent is to deal only with that part of the residual categorized as:

> *(1) activities oriented primarily to development of the skill and knowledge of members of the labor force who are already employed; (2) activities designed primarily to prepare persons, mostly youth, for entry into employment; (3) activities designed to develop skill, knowledge, and understanding which transcend the work world.*[6]

Since our main thrust is on the economic aspects of non-formal education, an illustrative "check-list"[7] of action orientated non-formal educational services by the various sectors of the economy such as agriculture, industry, health, labor and social welfare, etc., is helpful.

Before discussing economists' perceptions, it is useful to highlight educators' views of formal as opposed to non-formal education in order to get insight into the problem.

Educators' Perception

There are at least two distinct schools of thought among educators on the question of schooling. One argues that learning is a life-long, continuous process. Both formal and non-formal learning styles co-exist for this group. A great majority of educators such as Havighurst, Brembeck, and Adams hold this view. To them,

> *historically schools as we know them are relatively newcomers on the human scene. The act of learning, however, is as old as man himself. The human environment has always provided the stuff of learning, and the continuity of culture testifies to the effectiveness with which men learn from one another.*[8]

The need, therefore, is to see learning in terms of life spans rather than just a few years attendance in a school. Another group of educators argues that the current emphasis on the highly structured formal schooling indicates a serious lack of an organized search for non-formal alternatives. From the standpoint of the allocation of resources, controversy exists essentially between investment in man and investment in machines. Experience shows that often the latter wins, because the return is quicker, more tangible, less risky, and for machines there is little of the consumption-investment confusion. Whatever resources are allocated to education in both advanced and LDC's, most go to formal education and the non-formal segment remains neglected.

Disillusioned with the structured formal schools, writers such as Illich[9] and Reimer[10] advocate "deschooling" the society. According to Illich, *schooling* as opposed to *education* has become the modern dogma; the pupil is schooled to confuse teaching with learning, a diploma with competence.

> *His imagination is schooled to accept service in place of value, medical treatment is mistaken for health care, social work for the improvement of community life, policy protection for national security . . . not only education but social reality has itself become schooled.*[11]

His suggestions for reform are also radical. They include legal abolition of schools; prohibition of discrimination on the basis of prior schooling; creation of a "bank" for skill exchange and peer-matching by which the learned share their knowledge with those seeking instruction; institutionalization of skill exchange by creating free skill centers open to the public; consultancy by elders with regard to which skill to learn, which method to use, etc. Further, he suggests that proper planning, incentives, coupled with a network, should be developed to start not with the question, "What should someone learn?" but with the question, "What kinds of things and people might learners want to be in contact with in order to learn?" A similar sentiment is expressed by E. Reimer, in his book *School Is Dead*. He advances four main reasons for abolishing schools. *First,* schools create social

discrimination. UNESCO data indicate that most of the children in the world are not in schools. No country in the world can afford the education its people want. Then, it follows that discrimination arises in providing schooling for some but not for others. *Second*, school increases inequality in the distribution of income because it is the privileged who generally go to school longer and because costs increase with the level of schooling. Furthermore, schools are supported largely by general taxes that fall more upon the poor than their direct incidence suggests.

> *In Bolivia, for example, one half of all public allocations for schools are spent on 1% of the population. The ratio of educational expenditures on the upper and lower tenths of the population respectively, are about three hundred to one. Most parts of the world are nearer to the Bolivian . . .*[12]

situation. *Third*, a little schooling can induce a great deal of dissatisfaction. In 1960, half the children who entered school in Latin America never started the second grade. Three-fourths dropped out before they learned to read. Going to school means leaving the traditional life, moving to a different place, laying aside physical burdens for the work of the tongue and the mind, exchanging traditional food, clothing, and customs for those of the larger town or distant city. *Last*, school requires conformity and has become the universal church of technological society, incorporating and transmitting its ideology and conferring social status in proportion to its acceptance by the people involved. Reimer concludes by saying that

> *the major threat today is a world-wide monopoly in the domination of man's mind. We need effective prohibition of a scholastic monopoly, not only of educational resources but of the life chance of individuals.*[13]

These criticisms of formalized and highly structured schools are appropriate. Perhaps, consciously or unconsciously, through its monopoly on education, elements of societies are using the school system to maintain the barriers between "have" and "have-nots." But dismemberment of the school as an institution does not necessarily follow. The case is overstated and certainly ignores the complementarity and substitutability between formal schooling and non-formal

eduation. The suggestion for creation of a "skill bank" through an organization may mean, in its ultimate analysis, a sort of formalization. Again, education without school may well create social discrimination, because it is the rich who will be in position to employ tutors for their children. Secondly, they seem to ignore the interrelation of efficiency and conformity in a modern complex society. The loss to society in its search for efficiency in learning is some degree of diversity--presumably to be reintroduced by non-formal education. There is a "trade-off" between diversity and efficiency, and both are values worth seeking. The need, then, is to see learning in terms of total learning experience, in which the potentials of formal and non-formal education are recognized. The bold provocative thought on "de-schooling" society provides a powerful antithesis to formal schooling, but what may be needed is a synthesis--an optimum educational mix.

> *. . . the contrast between advocates and critics of de-schooling is a contrast in philosophies of life more than a clash between those who want schools and those who do not. There are those of us who advocate trust in man, the fostering of diversity, a belief in man's innate curiosity, and propensity for risky and unpredictable change. And, there are others of us who advocate trust in institutions, the development of more efficient schools, a belief that man needs external motivation and predilection for planned rational controlled change.*[14]

This brings us to the discussion of economists' view of non-formal education.

Economists' Perception

The economist can view non-formal education from at least *three* levels and can approach the problem arising at leach level. First, he may be concerned with the aggregate or "*macro*" level. This implies the study of the complete, integrated system of non-formal education (if such there be). In this case, main elements are the total number of educational inputs such as total student population, availability of funds, etc. No attention is paid to what happens to a particular program relating to on-the-job training or the psychological processes

of the students involved in a particular program. Thus, at macro level, economists are concerned with the appropriate level of investment in human capital as it relates to national manpower needs.

At the other extreme is the disaggregated, segmental, or "*micro*" level. It concentrates on analysis of individual programs or institutions, on problems concerning the *effectiveness* of expenditures in reaching stated (hopefully) objectives. The "return" from a training program for foremen in a particular factory is an example of the sort of concerns in this level of perception. This, incidentally, very closely resembles another academic box, *viz.*, "administration."

The third perception is *intermediate* in the sense that it is concerned with less than the aggregate but is concerned with sets of homogeneous elements of the micro universe. For some purposes, the binding characteristics might be the nature of the supplier--e.g., private financing of non-formal education. Or it might be functionally defined, e.g., literacy training regardless of supplier. Or, it might be defined in terms of the user, e.g., programs for business. There is considerable latitude in this category for definition of particular sets of programs depending on the interests and needs.

These three categories are reasonably clear and distinct and they permit different kinds of analyses to be brought to bear and the asking of different questions. Basically, though, the fundamental problem is one of the scarcity of real resources within non-formal education and for non-formal education in competition with other activities. The central theme at all levels is that fundamental to most of economics: the problem of wise allocation of scarce resources and their proper management. The problem is just as real in the area of education and training as it is in agriculture, industry, public utilities. But because of the nature of investment in human capital, it presents a more complex problem of evaluation.

With this brief introduction of economists' perceptions of non-formal education, we turn to a discussion of method of analysis. Then we shall discuss the rationale of an economic and social theory of non-formal education.

On Methodology and Assumptions

The term "methodology" refers to the techniques and procedures employed in the construction and verification of the relevant educational and economic principles. In passing, this study does not attempt to test correlational or experimental hypotheses of human interaction. But the study seeks to develop an economic and social theory applicable to non-formal education thereby providing modes of conceptualization for seeking, describing, and explaining empirical data.

The data and sources used are secondary. The main sources are books and journals on economics and education, government documents, publications of UNESCO and OECD, occasional research papers of various U.S. research centers, and some unpublished papers mainly by professors of Michigan State University.

A careful review of the existing scanty literature on the economics of non-formal education provided a starting point for data analysis and conceptual frameworks from which theories are generated. Theories developed in this study are specific, sharply focused on the area of non-formal education, and they are not intended to have wider applicability. Theory is expressed by a series of statements supported by evidence whenever possible. This evidence is organized either by applying the deductive or inductive method of analysis and is not verified by frequency of occurrence.

There is little literature on the economics of non-formal education. Intuition, speculation, and experience supplement this literature, and the text is in part expected to be inquisitive rather than definitive. With this general observation, the underlying logic follows under the general heading below.

Method of Analysis

As for method of analysis, the research can be conducted either by applying the analytical or deductive technique of analysis or by the empirical or inductive method of inquiry. The major point of difference between deduction and induction from the viewpoint of logic are well stated by Gee:

> *By deduction in logic is meant reasoning or inference from the general to the particular, or from the universal to the individual. Still more specifically deductive inference signifies reasoning from given premises to their necessary conclusion. Induction is the process of reasoning from a part to the whole, from particulars to generals, or from the individuals to the universal.*[15]

There is some disagreement among economists and educators over the relative merits of the two methods. One group feels that no aspect of economic theory is amenable to verification or refutation on purely empirical grounds.[16] But economists like Colin Clark[17] argue that the inductive method is the only scientific method of analysis and that at each step in a chain of analysis economic theory must be proved empirically. But "the tenor of present thinking is that they are complementary. That is to say that, deductive and statistical methods are mutually reinforcing."[18]

I have adopted both the deductive and inductive method of analysis. For example, the deductive method requires application of three major steps such as (a) postulating of assumptions; (b) deduction of reasoning from given premises to their necessary conclusion; (c) the testing or verification of these conclusions against observed facts.

The main assumptions underlying the study are as follows:

1. Current formal schooling is not capable of producing all types and quantities of educational output a modern society or economy needs. This can be treated either as an assumption or as an hypothesis to be tested. Here it is an assumption. Assuming the adequacy of formal schooling would have made concern with non-formal education unnecessary "by assumption."

2. The different learning environments of formal and non-formal education can co-exist in a society--a society which is *neutral* to formal and non-formal learning styles. Non-formal education is usually thought of in terms of the delivery system, but it can also provide a different learning style. A formal, structured, and graded system of schooling tends to produce a kind of learning atmosphere which may be altogether absent in many non-formal education situations

(e.g., learning on the job). Societies, of course, generally are *not* neutral with respect to formal and non-formal educational modes. As a matter of fact, education in both the Western and non-Western world is highly structured in part because of the "diploma mentality." And because of uncertainty, anxiety, and social rigidity, non-formal education is not considered on a par with formal education. This assumption simplifies the analysis and serves to stimulate examination of the roles of non-formal education.

3. Another important assumption is that of "other things being equal," which is a common device of economists. Conclusions can be deduced when peripheral variables are held constant. Generally the theoretical argument contains parameters[19] or data which are taken as fixed; it contains exogenous variables, values of which are determined outside the system, and it also contains endogenous variables,[20] values of which are implied by learning situations.

Again a number of relationships is considered such as those between education and employment, between demand for and supply of skills both at the micro- and macro-levels. I have deduced the conclusion that non-formal education can be an effective alternative to formal education. Although this broad conclusion has not been verified by conducting a "controlled experiment" yet I tried to adopt an inductive method of analysis wherever possible. This generalization is also tested--or at least "checked"--against whatever secondary data there is.

4. Finally, since resources are limited, the amounts and kinds of education to be provided are substantial public policy issues. This is really the heart of the matter and is in opposition to assumptions that there are no limits on education which should be socially provided.

A Brief Review of Literature

The recent surge of interest in non-formal education reflects the general concern of both educators and economists. As stated earlier, educators are sharply divided on the whole question of

schooling. The works of educators such as Havighurst, Levine, Curle Adams, and Don Adams are indicative of the fact that learning through formal and non-formal modes may co-exist side by side. Another group of educators, e.g., Illich and Reimer, advocate the complete abolition of schools on the grounds that schools are discriminatory, irrelevant to preparation for actual life and jobs, that they seek to maintain an elite control in society.

Economists, however, favor the idea that both formal and non-formal education can be a source of supply of skill in the market. Despite the difficulty of isolating investment from consumption and other problems involved in the complete acceptance of the human capital concept until recently, the work of T. W. Schultz is the pioneering work in this field.

Although the literature on the economics of formal education has greatly increased in the last decade, very little has been done with the economics of non-formal education. The several works of Harbison, Myers, Bowman, Eli Ginzberg, and others have shown that human resource development is possible through both formal and non-formal education. Solow[21] and Denison[22] have estimated the role of education (particularly formal education) by measuring the aggregate gains in the productivity of a nation's labor force. They hold the view that the improvements in productivity which are not due to an increased capital goods stock must be due to improvement in the quality of labor force. They conclude that formal education is the main reason for this improvement in labor's quality. This conclusion is based on the assumption that earnings differentials within the working force are due to differences in formal education which is, at best, only partially true. Skills have historically been acquired on the job, and formal schooling simply arose out of the experience of non-formal learning.

The value of on-the-job training has not, however, received much attention from the economists. Some studies[23] have been made to calculate the period of on-the-job training indirectly by deducting pre-school and formal school attendance period from the worker's age.

This does not provide us with any useful information on the measurement of on-the-job training as it is based on some faulty assumptions. First, it assumes that workers join the labor force immediately on getting out of school and that they continuously remain in training. Second, no attempt is made to discount the time likely to be spent due to frictional unemployment or the time used by the workers for pure consumption (i.e., leisure) purposes.

The importance of the on-the-job training poses problems of a serious nature for economists dealing with education. These problems are yet to be solved.

Machlup[24] identified three types of on-the-job training: (a) on-the-job training from experience, some of which is unavoidable and does not constitute training, (b) on-the-job training under the guidance and care of senior workers in the same line of production, and (c) off-the-job training which involves the provision of classrooms inside the factories. Machlup's concept of on-the-job training which forms a significant part of non-formal education seems to be too narrow, for two reasons:

First, the unavoidable job experience should be treated as non-formal education. He did, of course, recognize fully the significance of labor mobility associated with the experience of the worker. Furthermore, the work experience tends to increase the employment and the earnings potential to family heads.

Second, off-the-job training can be arranged either by a particular firm or by the industry as a whole. In this regard there exists the possibility of such training both vertically and horizontally.

Gary Becker[25] discusses two types of on-the-job training: general and specific. According to him,

> *general training is useful in many firms besides those providing for it; for example, a machinist trained in the army finds his skill of value in steel and aircraft firms and a doctor trained (interned) at one hospital finds his skills useful at other hospitals.*

Again,

> *training that increases productivity more in firms providing it will be called specific training. Completely specific training can be defined as training that has no effect on the productivity of trainees that would be useful in other firms.*

Becker argues that in competitive markets employees pay all the costs of their general training on the job because they receive lower wages than they would be able to earn working "full time" (i.e., without training time) at another job. Becker's theory can be criticized on the following four grounds: It appears, however, that the firm which arranges the training also bears the cost of this training in that this training may be utilized by other firms. In other words, the expenditures on training (whether or not they actually are borne by the labor force) generate economies external to the firm.[26]

Second, it is implicit in his analysis that general training is going to be a more important phenomenon than specific training. The good place to receive general kinds of training is the formal school. This analysis suggests at least "one force favoring the transfer from on-the-job training to attending school."[27]

Third, Becker's neat distinction between specific and general training ignores the possibilities of unavoidable "learning by looking" and experience. This aspect of labor training is significant both from the viewpoint of mobility and quality of the products. Job experience may tend to increase labor mobility. Further, the firm can measure the cost of maintaining the experienced and inexperienced worker, it is conceivable that firms could measure the quality of their outputs.

Lastly, Becker's analysis of specific training for a specific job in a specific industry causes some difficulty. Even in equilibrium where demand for and supply of skilled personnel are equal, an employee can quit his job or be fired, thereby disturbing the equilibrium. This suggests that there is a zone of bargaining which is not explored by Becker.

> *All that needs to be assumed to make Becker's theory applicable to the real world is that (a) general trainees are paid less than the going rate for performing same skilled task and that (b) specific trainees tend to be paid above the going rate in the firm providing specific training.*[28]

Nevertheless, his analysis is powerful enough to undertake meaningful economic studies of labor training, wage determination, labor contracts, fringe benefits, etc. Mary Jean Bowman commented on the Becker studies:

> *There are many imperfections in their work, but it nevertheless is an important beginning indeed, it may prove to be a critical breakthrough in the development of tools for analysis of the roles on on-the-job training and ultimately also for broader comparisons among societies that differ substantially in their educational and training systems. When all this is said, the fact remains, nevertheless, that the economist alone is not likely to get into the intensive analysis of variations in the roles and efficiency of differing kinds of schooling and their relation to on-the-job training that are of vital interest to many educators.*[29]

Another point which needs further clarification concerns the choice between the two types of on-the-job training: general and specific. A clear cut answer to this question of choice may not be possible. But in a rapidly changing technological society such as the U.S., emphasis on specific types of on-the-job training is not recommended. More and more emphasis should be given to a general type of on-the-job training. But a problem arises. Why would firms train people on the job for others in a competitive market economy? The manpower implications of such training, however, call for social intervention by the state in the form of tax incentives, and other fiscal and monetary incentives.

Lastly, Jacob Mincer tried to develop theoretical and empirical analyses of education and on-the-job training with emphasis on their effects on earnings, employment, return, and other economic variables which are only a segment of the non-formal education. This has been expanded in Chapter IV where his works have been examined in some detail along with the works of Borus and others on cost-benefit analysis on training and re-training the unemployed.

NOTES: CHAPTER I

1. A draft working paper on non-formal education, AID/Bureau for Technical Assistance (Washington, D.C.: Office of Education and Human Resources, October 1, 1970), p. 2.

2. Russell J. Kleis, Charles L. Lang, John R. Mietus, and Fia T. S. Tiapula, "Toward a Contextual Definition of Non-Formal Education" (paper presented before the non-formal education seminar, Gull Lake, June 8-9, 1972; Michigan State University, East Lansing), pp. 1-3.

3. *Ibid.*

4. Cole S. Brembeck, "The Strategic Uses of Non-Formal Education," in *New Strategies for Educational Development: The Cross-Cultural Search for Non-Formal Alternatives*, ed. by Cole S. Brembeck and Timothy Thompson (Lexington, Mass.: D. C. Heath and Co., 1973), Chapter 5.

5. Frederick H. Harbison, "Human Resource Approach to the Development of African Nations" (Washington, D.C.: American Council on Education, 1 Dupont Circle), p. 11; also appears in *New Strategies for Educational Development: The Cross Cultural Search for Non-Formal Alternatives*, ed. by Cole S. Brembeck and Timothy Thompson (Lexington, Mass.: D. C. Heath and Co., 1973), Chapter 1.

6. *Ibid.*

7. See footnote no. 1, above, and also see John M. Hunter and Fernand L. Goudreault, "An Approach to Inventorying Non-Formal Education" (unpublished paper prepared for IISE, Michigan State University, East Lansing).

8. From the introduction of the book, *New Strategies for Educational Development: The Cross-Cultural Search for Non-Formal Alternatives*, ed. by Cole S. Brembeck and Timothy Thompson (Lexington, Mass.: D. C. Health and Co., 1973), p. 3.

9. I. Illich, *De-Schooling Society* (New York: Harper and Row, 1970).

10. R. E. Reimer, *School Is Dead* (Garden City, N.Y.: Doubleday and Co., 1971), Chapter 1, pp. 21-30.

11. Illich, *op. cit.*, cover page.

12. R. E. Reimer, *op. cit.*, p. 25.

13. *Ibid.*, p. 30.

14. R. J. Havighurst and D. U. Levine, eds., *Farewell to Schools??* (Worthington, Ohio: C. A. Jones Publishing Company, 1971), p. 82.

15. Wilson Gee, *Social Science Research Methods* (New York: Appleton-Century-Crofts, 1950), p. 206.

16. Ludwig Von Mises, *Human Action* (New Haven, Conn.: Yale University Press, 1959).

17. Colin Clark, *The Conditions of Economic Progress* (London: Macmillan, 1940), vii-viii.

18. C. E. Ferguson, *Micro-Economic Theory* (Homewood, Illinois: Richard D. Train, Inc., 1969), p. 5.

19. In statistics we are concerned mainly with the question of making inferences about a population based on data contained in a sample. Inasmuch as population is characterized by numerical descriptive measures called parameters such as the mean, the standard deviation, or the area between two values of the variable . . ., given the value of the parameter, we may make decisions or may be required to estimate the value of the parameter.

20. A variable is defined here as a value that is subject to change. A variable is a number usually symbolized by a letter such as x, y, z, etc. (E.g., in the case of non-formal education variables may be x_1 = parents' income, x_2 = parents' occupation, x_3 = density of the population, and so on.) Independent variables may be qualitative, e.g., "foreman" in a study of variables affecting yield in a manufacturing production study. The variables may be exogenous (i.e., having its origin external to the education system) such as student population growth, governmental activity, location, etc. The variables may be endogenous which are to be determined by the operation of the educational system such as wages of the worker, receiving training on the job, employment prospects of persons receiving non-formal education, and so on.

21. See Hans Thias and Martin Carnoy, *Cost Benefit Analysis in Education: A Case Study on Kenya* (Washington, D.C.: World Bank, NDEC 173, 1969; mimeographed).

22. See C. R. S. Dougherty, "The Optional Allocation of Investment in Education," Development Advisory Service, Harvard University, April, 1969.

23. F. K. Nohko, *et al.*, *Educational Planning in the USSR* (Paris: International Institute of Educational Planning, UNESCO, 1968).

24. F. Machlup, *The Production and Distribution of Knowledge in the United States* (Princeton, N.J.: Princeton University Press, 1962).

25. Gary S. Becker, *Human Capital: A Theoretical and Empirical Analysis With Special Reference to Education* (New York: National Bureau of Economic Research, 1964); see also his article, "Investment in Human Capital: A Theoretical Analysis," *Journal of Political Economy*, LXX (Supplement, August, 1962).

26. In economics, a profit maximizing firm is in equilibrium when marginal receipts are equal to marginal expenditure. But once the element of on-the-job training is introduced, the time factor has to be considered. Because there might be inequality between receipts and expenditures in the short run, firms may find it worthwhile to impart training on the job if "future receipts were sufficiently raised or future expenditures are sufficiently lowered" so as to bring out an equilibrium between marginal products and wages in the long run. In symbols, Becker stated this equality between present values of receipts and expenditures as follows:

$$\sum_{t=0}^{n-1} \frac{R_t}{(1+i)^{t+1}} = \sum_{t=0}^{n-1} \frac{E_t}{(1+i)^{t_1}}$$

where E_t and R_t represent expenditures and receipts during period $t + 1 = t$ the market discount ratio, "n" represents the number of periods.

Clearly the equation states that the present value of marginal products stream would have to be equal to the present value of the wage stream.

27. T. W. Schultz, "Investment in Human Capital," *American Economic Review*, Vol. 51 (1961).

28. Mark Blaug, *An Introduction to the Economics of Education* (Baltimore, Md.: Penguin Books, 1972), p. 193.

29. Mary Jean Bowman, "Converging Concerns of Economists and Educators," *Comparative Education Review* (October, 1962); reprinted in *Education and the Economics of Human Capital*, ed. by R. A. Wykstra, *op. cit.*, p. 65.

CHAPTER II

TOWARDS AN ECONOMIC AND SOCIAL THEORY OF NON-FORMAL EDUCATION

Implications of Non-Formal Education

Non-formal education can do many things, fill many holes. It is convenient to approach understanding it and its implications by describing its functions in terms of various deficiencies or deficits or what I have chosen to call "gaps." These inter-related gaps are the following:

a. Job gap
b. Efficiency gap
c. Demand/supply gap
d. Population and cost gap
e. Wage gap
f. Equity gap
g. Adaptability gap
h. Evaluation gap
i. Expectation gap

Job Gap

Non-formal education, if properly planned, can play a significant role in reducing the job gap--a gap caused by education outrunning employment for both the employed and those who are yet to be in the labor market. In Bangladesh, for example, non-formal education might be used for retraining the over-educated unemployed/underemployed to the end of making more people employable. In such circumstances, non-formal education may be an alternative or complement to formal education. This aspect of non-formal education is discussed both theoretically and empirically.

Theoretically, non-formal education could fill the educational gap to a large extent. It is argued that formal schooling is producing skills and knowledge which are not job specific. This is particularly true in unplanned economies.

The education gap as demonstrated in Figure 1 may be seen from the micro viewpoint. We are depicting here an hypothesized relationship between the skill of an individual worker and job qualifications required by a typical firm in a changing economy.

The reason the job requirement curve (EE) is positively sloped is because the job requirements of a technological society or of a developing society tend to increase through time because of a higher demand for skills or because of the increasing complexity, sophistication, differentiation, and standardization of the product. The skill curve (SS) is shown negatively sloped because educated workers initially may have more skill than the job requires (i.e., gap left of P). The individual workers may not keep pace with the demand for skill actually required by the firm over time.

It is assumed here that the individual worker concerned is *not* attempting to up-date his skills through non-formal education. This seems to be a realistic assumption supported by the fact that the U.S. has several times undertaken retraining and skill up-dating programs. Incidentally, even if one postulates no loss of skill (i.e., SS is horizontal), the two gaps described remain although their sizes are smaller.

Non-formal education may be an *alternative* or substitute in filling up the gap to the *left* of P. Perhaps, persons produced under a graded curriculum in formal schooling are too highly qualified. Possibly, the training of craftsmen for modern sector activity can be carried out either through apprenticeship arrangements or by some less formal means of learning on the job. "Substitutabilities between vocational training on the job and in-school are not as extensive as is often assumed. This is the source of many fallacious educational recommendations. Schools are well adapted to prepare men to be able to learn on the job."[1] "Filling the gap" in this sense means utilizing resources used for producing redundant skills to produce more appropriate ones. Despite the fact that education is a complex social product, here education expenditures for non-formal education are seen as investments.

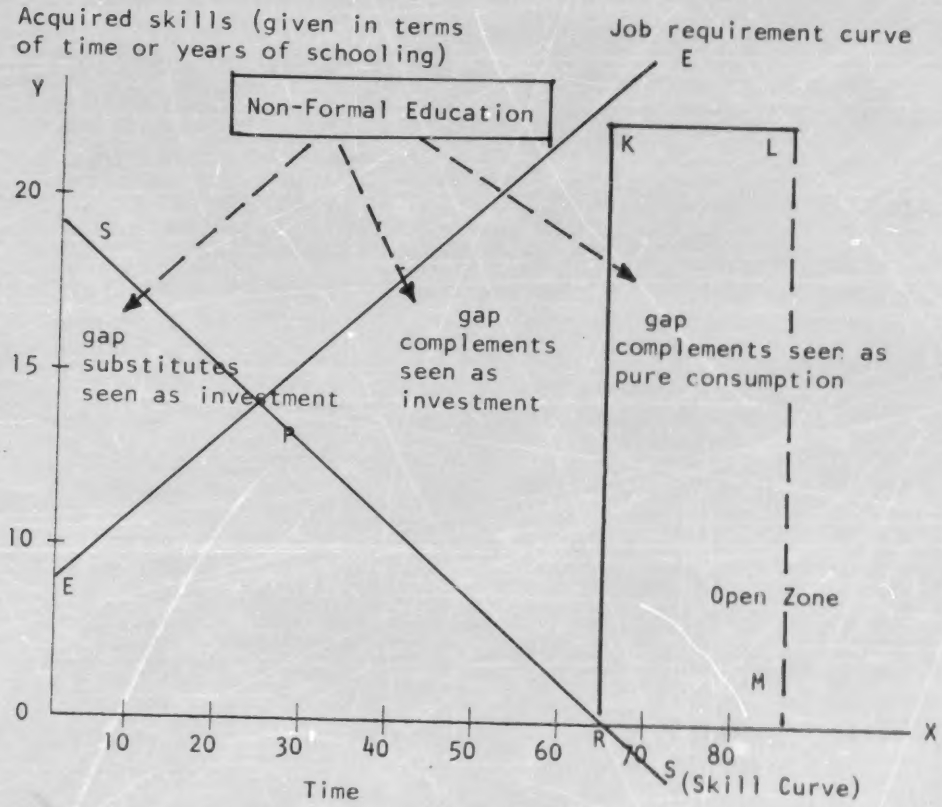

Figure 1.--Hypothesized relationship between job and skill from micro viewpoint.

Here X axis represents chronological time in which society is experiencing social-economic development;

Y axis represents acquired skill at a particular point of time assumed to be given: *not* to be changed by any kind of educational programs--formal or non-formal;

At time 0, the economy is under-developed;

P shows equality between skill and job;

EE represents job requirement curve as economy develops job requirements, there is a need for increasing technical know-how for a firm;

SS represents skills which tend to become obsolete over time if no effort is made to update the skills by the individual;

R shows arbitrary retirement age (e.g., 65 years);

KLRM shows open zone after retirement.

Non-formal education can largely serve as a *complement* in filling the education gap to the *right* of P. The category of program for development of employed manpower would include various activities such as in-service training in manufacturing, construction, government and semi-government agencies, agricultural extension to rural areas, and increasing facilities for "learning by doing." This is also seen as an investment. As Kenneth Arrow argued in his "Learning by Doing," "human resource development is a function of the stimulus of continuously changing technologies, and these are associated in turn with gross rates of investment in physical capital." Mary Jean Bowman also argued that

> *strategies developed in disregard of what exists and might be done outside school doors are disregarding important complementaries and are not likely to be the most efficient. This is not just a matter of curriculum adaptations. Our ignorance is great here but there is also much unused knowledge.*[2]

Non-formal education can also serve as a complement in filling the gap of *Open Zone* which refers to the period of life after retirement. Since educational expenditure is not strictly productive in the economic sense, this is seen as pure consumption expenditure.

Even if we look at the problem from a macro viewpoint it is possible to conceive of the gaps between the demand for and supply of skills, particularly in the LDCs. This is demonstrated graphically in Figure 2.

In some situations, particularly in the Far East, we see the situation represented to the left of AP where the educational gap is "positive." More skills are provided by the educational system than are required, leading to the curious and dangerous phenomenon of the "unemployed" intellectual. This is, it will be noted, a problem of *quality* rather than one of quantity in terms of the skills produced. Beyond some levels of development (AP), the demands for skills become greater than that provided through the traditional style. This may be a matter of both *quantity* and *quality*.

Even if we consider a planned economy such as the U.S.S.R. where schooling in its broad sense should discharge a flow according

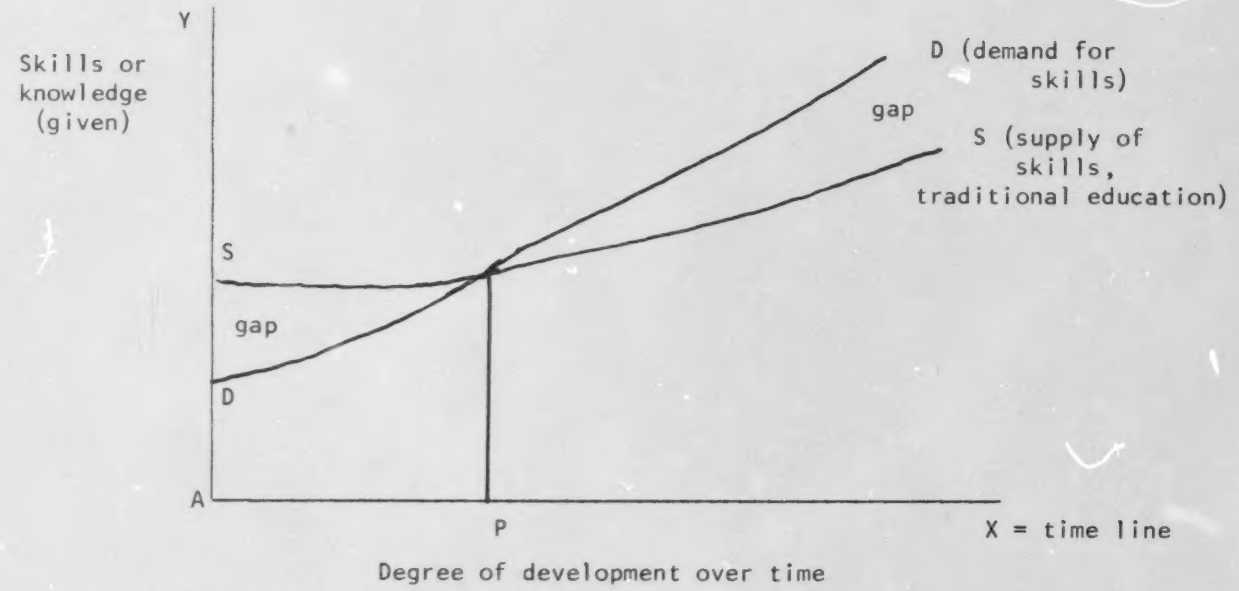

Figure 2.--Hypothesized relationship between demand for and supply of skills from macro viewpoint.

to job requirements, the understanding of the complementary and substitutability aspects of non-formal education are important simply because the educational gap is bound to develop beyond a certain point as is shown in Figure 3.

In Figure 3, both the education and employment curves remained one and the same up to the point P; after that a *gap* has been created between education and employment. The reason is that in a planned economy, formal schooling was in a position to establish a link with the plan which is usually drawn in terms of five years. Even if this plan for five years is drawn within the perspective of twenty years as we find in the case of Pakistan, the educational gap is still likely to emerge because a specialist is likely to use his skill over a long period of time (say, 30 to 35 years). If he does not systematically make an effort to up-date this skill, it is likely to be obsolete by the time of his retirement. Evidently there is an implication for non-formal education.

Understanding these aspects of non-formal education will enable us to understand the price mechanism, elasticity of demand, and resource allocation. When non-formal educational programs are

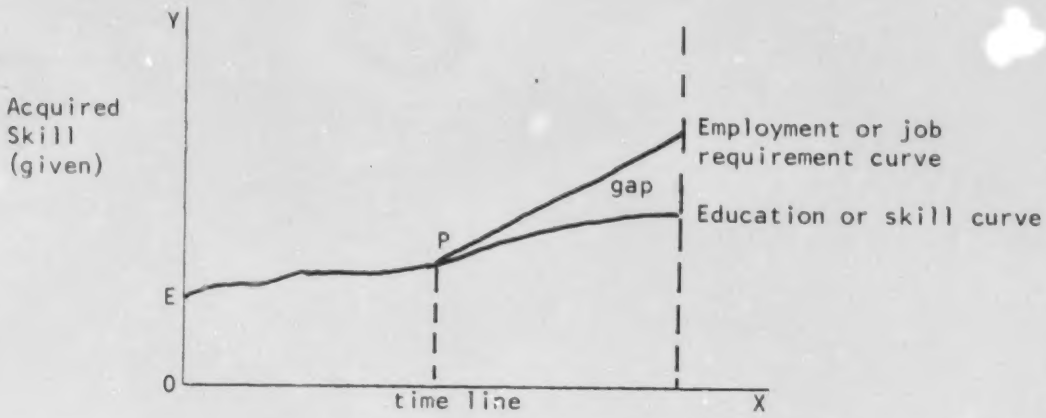

Figure 3.--Hypothesized relationship between education and employment in a planned economy.

an alternative or substitute source of skills salable in the job market, the demand for non-formal education will *increase*, if the price of education through formal school (*ceteris paribus*) *increases*. This increase in the demand for non-formal educational output will be greater, the greater are the possibilities of substitution between educational output produced by formal and non-formal modes of learning. This arises simply out of the substitutability characteristic. In other words, if the educational output produced by both formal and non-formal modes of learning are close substitutes for each other, a rise in the price of one output results in an increase in the demand for the other with a consequent, determinate rise in its price.

But the reverse is the case if educational output and services produced are complements. The rise in price of one educational output will lead to the fall in the demand for the other. For example, the demand for envelopes falls as the price of writing paper rises and less of it is used. The measure of the responsiveness of one variable to change in another insofar as the educational output is explained in terms of cross elasticity of demand.[3] In the context of educational output, we are concerned with the demand for non-formal educational output as it is affected by a price change for formal education (other things being equal). This concept of cross elasticity of demand can serve two purposes: *First:* it can indicate the degree of substitution between formal and non-formal educational output. It should provide an evaluative measure of gaps in the chain of substitution between formal and non-formal educational output. *Second:* it can help resolve the problem of allocation of resources. Cross elasticity can be positive or negative. When cross elasticity of demand is positive, two commodities are likely to be substitutes, and when it is negative, two commodities are likely to be complements.[4]

Thus if formal and non-formal educational output are close substitutes a rise in the price of formal educational output is likely to lead to the *increase* in demand for non-formal educational output. This is the case of positive cross elasticity of demand. Again on

the other hand, if two educational outputs are complements, an increase in the price of educational output from formal schooling is likely to *decrease* in the demand for non-formal educational output. This means negative cross elasticity of demand. For example, bankers, forest rangers, auto mechanics, business managers, shopkeepers, to mention only a few, can be trained either in schools or on the job, subject to "critical education" as shown in Figure 4.

Let us examine the nature of the curves before taking up their implications in Figure 4B. Here the critical education areas as indicated by OT_1ER refers to basic skills of reading, writing, and the necessary knowledge of arithmetic required for the job. This critical education may be dispensed either through formal or non-formal means, but for the sake of simplicity it is assumed here that it is received in school at least through the secondary level. Another reason for this assumption is that it is easier to calculate the costs. In the case of formal schooling, the measurement of unit cost (e.g., cost per additional year of schooling) is relatively easy compared to non-formal education. In some cases non-formal education (e.g., on-the-job training) involves no extra costs resulting from an increase in output of one unit.[5] In Chapters III and IV we shall elaborate this point.

Now once this critical education is received, one can learn the principles of banking and managing either in school or on the job as an apprentice. This is shown diagramatically (see Figure 4B) with both employees having received critical training skills OR in time OT_1. One worker begins life-long non-formal training and acquired skills along the line EH. The other continues formal education through time T_1C at which point he has a level of skill CK which is evidently greater (by DK) than that possessed (CD) at the point in time by his counterpart. Now the employer is faced with a choice: if he hires personnel trained in school or college, he is likely to get a person with the latest techniques of management skill (i.e., as indicated by the gap DK), but after apppointment if he does not receive any in-service training or makes no conscious effort to

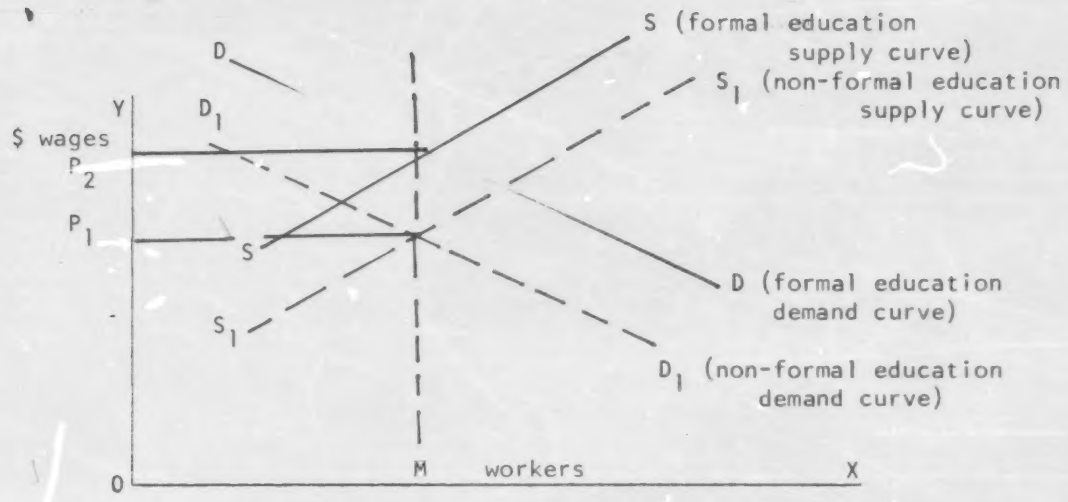

Figure 4A.--Supply-demand model for equilibrium wage.

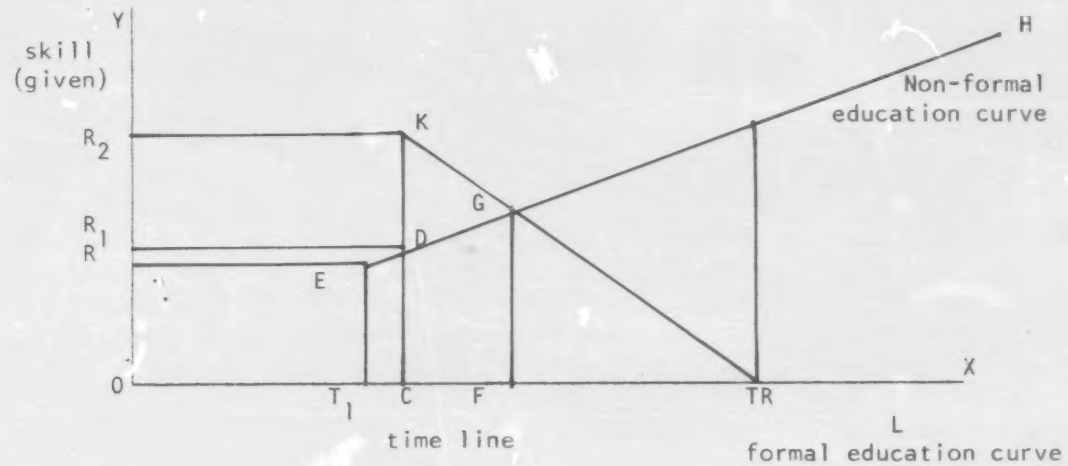

Figure 4B.--Hypothesized relationship between formal and non-formal educational output (e.g., bankers, business managers, auto mechanics, etc.).

X axis represents time (e.g., age);

Y axis represents acquired skill assumed to be constant but economy is developing and demands for higher skill with the advance of the economy assumed. We are also measuring wages with the help of y axis.

TR represents retirement age;

0 T_1 E R critical eduation area--minimum education needed to start the job.

With the help of this figure we can explain the diverse relationships between non-formal and formal education.

gather experience on the job, his skill, however current it may be, is likely to deteriorate. This is why the formal education curve is shown negatively sloped.

The non-formal education curve is positively sloped for a simple reason. After receiving the basic education, the person concerned is making a conscious effort to learn on the job either through in-service or apprenticeship training. We have empirical evidence to show that learning by doing is a slow but steady process of learning compared to learning the same skill in the schools.[6] Thus initially he may be in a disadvantageous position but ultimately he tends to have an advantage over the person with a formal education background.

With this brief explanation let us suppose that industry wants to hire (see Figure 4A) business managers or bank managers. The critical education area, OT_1ER, is the same for all of them. Now if industry wants to hire managers from the non-formal education, it would pay OP_1 as a wage indicated by the equality of demand and supply and hire OM workers. The demand is related to value productivity to the employer; the supply, similarly, is related to costs of acquiring training, among other considerations. With respect to products of formal education, the parallel demand and supply relationships would be as follows: The demand for each level of employment would presumably be higher since worker productivity would be greater as indicated in Figure 4B at time point C. The supply would be smaller at each level of employment reflecting the investment required in time T_1C to obtain the formal education skills. Thus the equilibrium wage rate (OP_2) is higher than that for non-formal education output.

Now the question arises as to whether it is profitable for the firm to hire non-formal education managers at a wage equal to that it would pay for managers coming via a formal education program. In the short run this is uneconomic since the firm would be paying more than the value of their marginal products. Quantitatively, this "loss" is the "extra" wage, P_1P_2, times the number of managers hired, OM. But from the long viewpoint it may be advantageous for the firm

to hire at OP_2 because after the time OF, the non-formal education manager becomes the real asset for the firm. In terms of knowledge and skill, he has a decisive advantage over the formal education manager as indicated by the gap to the right of point G. The higher wage offer to non-formal education output, despite the initial lower skill compared to formal education output, is likely to act as a positive incentive to learning. Although it is difficult to assess the impact of this incentive accurately partly because of the lack of adequate data as well as inadequacy of the theory of learning insofar as non-formal education is concerned, yet common sense suggests that this higher wage tends to accelerate the rate of learning through earning. The knowledge of modern management techniques and some pioneer works dealing with the complex issues of pedagogy, sociology and psychology may be useful. It is assumed here that managers from formal education are receiving no non-formal or in-service training to up-date their skills and thereby following the same line of analysis of Figure 1, to explain the gap right of point G in Figure 4B above. From this analysis we can deduce the following conclusions:

(a) With the increase in the cost of basic education the cost of the formal education is likely to be more than the non-formal education, because in many situations, non-formal education (e.g., learning by doing) involves no marginal costs.

(b) If non-formal education is a substitute for formal education as regards the salable skill in the market, the demand for non-formal education tends to go up with the increase in the price of formal education.

(c) If non-formal education programs become the complementary source of supply of skill in the job market, the demand for non-formal education will decrease with the decrease in the demand for complementary formal education. This will arise because of the complementary characteristics explained earlier.

(d) If the factory becomes the classroom for workers, both the workers and employers will be benefited. Workers are likely to be more committed to work; they are also likely to be more contented.

Encouragement of attaining higher skill implies higher remuneration and recognition. Employers will be getting the benefits because there is likely to be less turnover of workers; there will be less chance of a strike. A better employer and employee relationship in a job economy such as the U.S. is bound to reduce the social tension.

The analysis of educational output in terms of cross elasticity of demand is very important because the measure of the degree of substitutability between formal and non-formal education helps resolve the problem of allocating resources--a central issue in economics.

It is appropriate at this point to examine the various levels involved in macro decision-making as it concerns the allocation of resources. Allocation *is* a problem because resources are limited relative to competing demands. The stages are as follows:

1st stage →	Determination of overall educational priorities and objectives and identification of areas of concern		
2nd stage →	Formal education programs: selection of inputs (e.g., student, teacher, housing, etc.		Non-formal education programs: selection of inputs (e.g., school dropout, educated unemployed, etc.)
3rd stage →	Establish linkages through system analysis approach, knowledge of elasticity; its application		
4th stage →	Allocation of funds	Implementation	Allocation of funds
5th stage →	Formal education output		Non-formal education output
6th stage →	Total human resource development		
7th stage →	Foundation of social infrastructure for growth, development, and change		
8th stage →	Evaluation		

A little discussion on each of the various stages of educational output seems necessary.

1st stage: The first task of the education planner is an agreement on program objectives and goals and identification of areas

concern regardless of fund commitment and mode of learning. This will enable the educators, economists, and planners to have a better perspective of the overall problem and to set up priorities.

2nd stage: An overview of the problem will enable professionals and politicians to identify the client group to be served. Regular students, disadvantaged, unskilled, unemployed school dropouts, etc., may be the target groups of the program. This brings the question of choice as to whether a target group is to be served by arranging formal schooling or not. For instance, if the target group is composed of technologically unemployed persons requiring retraining, perhaps non-formal education is well suited. But, if the objective is to reduce the school dropout, perhaps reforms in the existing school programs seem necessary. Sometimes objectives may not be defined in terms of the person trained.

3rd stage: When the various alternatives modes of learning are explored, an effective linkage is needed in order to avoid economic waste resulting from duplication and unnecessary complication. At this stage, the knowledge of demand for and supply of trained personnel is imperative. Proper analysis of the demand and supply relationships will enable the planner to identify the resources needed to accomplish the desired educational tasks--essentially solving the problem of allocation of funds.

4th stage: But the allocation of funds and implementation process are simultaneous. Only through efficient implementation can we

5th stage: expect optimal educational output. Here by formal and non-

6th stage: formal educational output I mean total educational effort for the development of the skill and capacity of the people involved.

7th stage: At stage seven, however, we find the development of new skill and knowledge which may be expanded as a part of the social infrastructure which is very much needed for growth. New knowledge and skill appear--replacing the older ones. But even educational investments tend to remain and to be self-reinforcing.

8th stage: In the light of changing circumstances, the work of the evaluation will start to set up new areas of concern, new educational priorities, and new policies. Thus, the circle is complete; its lesson is that there is no end to the tasks of allocating and re-allocating funds. The economic philosophy is that allocation of funds for the development of human resource is not an end in itself but a means to some end. This end surely varies from society to society--a critical point for planners and advisors to bear in mind.

Empirical Analysis

We have examined complementarity and substitutability between formal and non-formal education in theory. Now we examine the issue empirically. Non-formal education may play an important role in modernizing the industrial sector as well as peasant or agriculture sector of the LDCs. In the industrial sector, the most critical manpower requirements tend to be for people with *middle level* skills. Lewis characterizes the products of secondary school as the backbone of public administration. According to him: "The middle and upper ranks of business consist almost entirely of secondary school products, and those products are also the backbone of public administration."[7] Non-formal education can play a crucial role in filling the gap between employment and education for those who have successfully completed the secondary education. Intensive and extensive training programs could do this within specific reference to job requirements. Moreover, non-formal education is especially suited for attacking the problems of school dropouts and "educated unemployed."

Non-formal learning modes seem to be particularly suited to *retraining* facilities.

It is paradoxical that in many less developed countries, manpower "shortages" co-exist with manpower "surpluses." Professor Harbison[8] mentioned six categories of shortages of manpower: (1) shortages of highly educated professional manpower such as scientists, engineers, etc.; (2) shortages of top-level managerial and administrative personnel; (3) shortages of teachers, particularly teachers in secondary education; (4) shortages of technicians, nurses, agricultural assistants, etc.; (5) shortages of craftsmen of all kinds such as stenographers, bookkeepers, business machine operators, and (6) shortages of miscellaneous categories of personnel such as radio and TV specialists, watch repairers, etc. With regard to the first *two* categories of shortages, non-formal education can be complementary; it can bring freshness and help people stay up-to-date in their areas of specialization. A fairly high rate of obsolescence in a rapidly changing society is a common phenomenon. Possibly, non-formal education can deal with the problem of obsolescence more effectively than formal learning in schools.

As for the remaining four categories of shortages, non-formal education can possibly substitute for formal schooling in most of the cases such as the training of nurses, agricultural extension agents, radio and TV specialists and the like. In such training, non-formal education can relate to economic and social conditions and to the cultural heritage of less developed countries where imported formal education models have failed at least in part in content and method.

The significance of non-formal education can hardly be overestimated even in a "job economy" such as that of the U.S. where 90% of 86 million in the labor force in 1972 were employees as opposed to being self-employed or being employers. This job economy operates in a world of change--technological, economic, social, and legislative change.[9] The dynamics of an advanced economic system gives rise to a host of manpower problems. Non-formal education can work in two important directions: *First*, it can be a system of retraining in

minor or major increments. The applications of electronics and atomic energy in the production process have led to the development of new processes, new techniques, and new products. The skill learned through a formal system, however current it may be, is becoming a skill for yesterday, and we have already noted the high rate of obsolescence in a technological society. Coombs describes the problem:

> *With knowledge, technology and job characteristics all changing very rapidly, there is today a universal problem of keeping the content of education up-to-date--of giving students an education that will fit them for the different world they will live in tomorrow. Teachers and textbooks--the two major conduits by which the "stuff of learning" gets piped into the classroom--have a high rate of obsolescence in this rapidly changing world. No satisfactory measures have yet been found, or at least widely applied, for keeping teachers and textbooks regularly up-to-date.*[10]

Second, non-formal education seems to be consistent with a much "wider spectrum of individual differences and needs" in a society of diversified population. This is particularly true in a country such as the U.S. where significant social change is taking place. Non-formal education can be utilized to increase the education base of its diverse people, thereby reducing economic and social discriminations. Formal schooling which may well serve the purposes of an elite can hardly be expected to convert easily into "mass educational system." As employers' expectations regarding the educational attainment of the employee increases, non-formal education may be the vehicle through which much of that attainment may be achieved. Employers now expect to use high school graduates (or their equivalents): non-formal education may provide the "equivalents." Recently, Professor Maton studied experience on the job as a substitute for formal training.[11] A primary school graduate aiming to become a fully skilled mechanic can follow one of the two learning processes--formal training and on-the-job experience or a combination of both. In the example presented in Table 1, he identified seven possible combinations of formal training and on-the-job experience. The first of the seven combinations indicates that a primary school graduate needs 13 years of experience on the job without any further formal education and so on.

TABLE 1

Combinations of Training and Experience Required to Become a Fully Experienced Tool and Die Maker

Numbers of combinations	1	2	3	4	5	6	7
Years of formal training (E)	0	1	2	3	4	5	6
Years of on-the-job experience (Y)	13	10	7	4	2	1	1

Source: *International Labour Review*, September, 1969, p. 241.

Similar empirical substitutability curves for some specific occupations such as assistant engineers, junior technicians, and skilled workers have been drawn for Belgium and Argentina (Figure 5).

I. Assistant engineers		II. Assistant engineers	
E = 0	Y = 20.1	E = 0	Y = 17.2
3	16.0	3	11.2
6	6.3	6	4.2
9	1.4	9	0.7
II. Junior technicians		**IV. Junior technicians**	
E = 0	Y = 13.4	E = 0	Y = 11.2
3	8.9	3	7.7
6	3.1	6	5.1
9	2.0	9	0.8
III. Skilled workers		**VI. Skilled workers**	
E = 0	Y = 11.9	E = 0	Y = 13.8
	5.7	3	7.3
	2.6	6	2.2

E = years of formal training.
Y = years of on-the-job training.

Source: *International Labour Review*, September, 1969, p. 243.

In this analysis only the time requirements have been taken into account. There seem to be advantages and disadvantages of each of the combinations

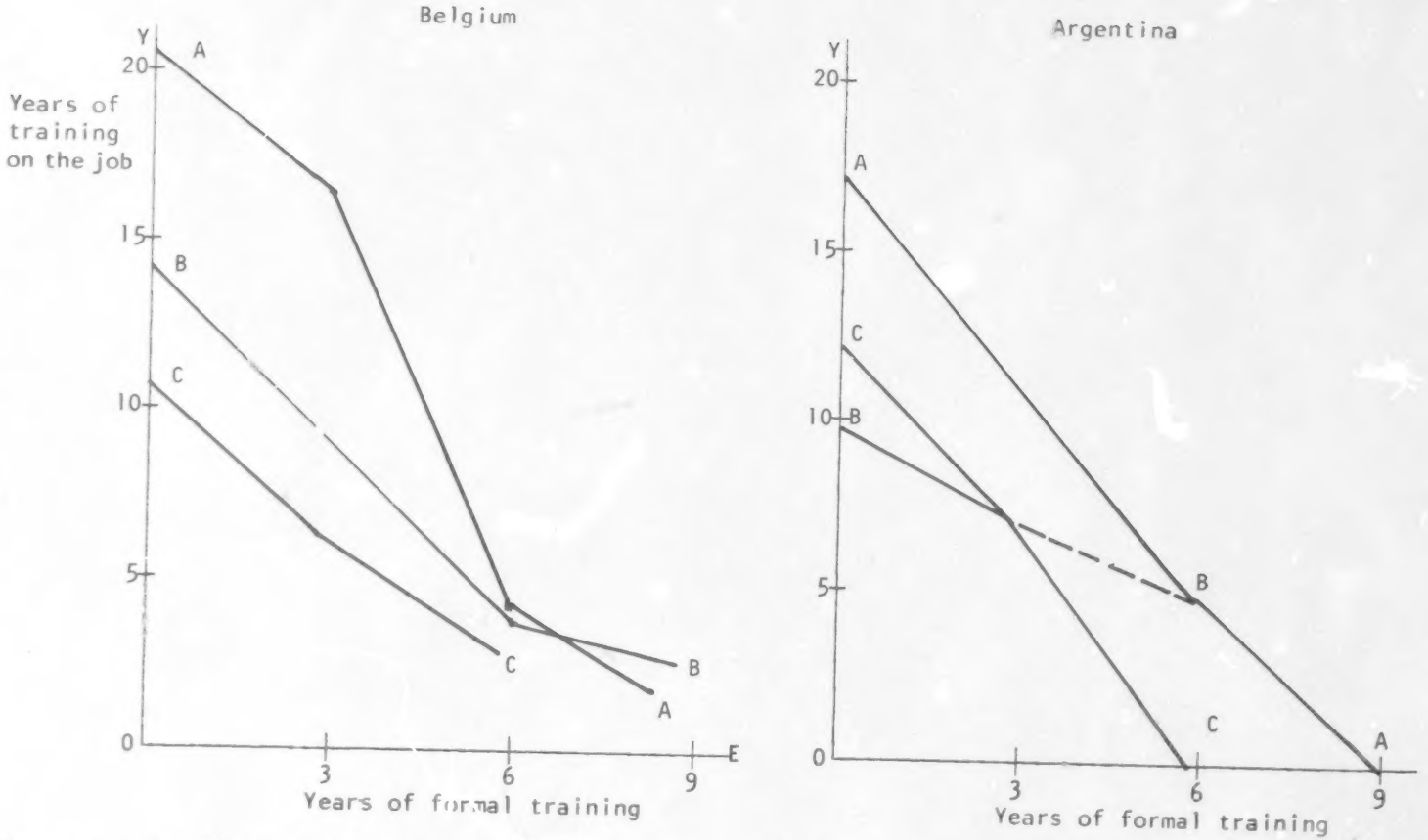

Figure 5.--Possible combinations of experience and formal training required for certain higher level jobs in Belgium and Argentina.

AA = Assistant engineers; BB = junior technicians; CC = skilled workers.

Source: *International Labour Review*, 1969, p. 241.

of formal training and experience on the job, and certainly one approach to choosing alternatives is to estimate costs for each.

A primary school graduate taking no further education may need 13 years of experience on the job to be a tool and die maker. This is a long time. But here *no* marginal cost is involved in learning this skill: the worker starts earning and producing immediately so no income is forgone. But in the case of combination number 6 (Table 1) it is possible to reduce drastically the years of on-the-job training. The trainee, in this case, starts earning as a tool and die maker at the end of 6 years instead of 13 years. The optimal combination is difficult to determine. At the outset, it may differ for society and the individual. Theoretically, least cost combinations for society and each individual are determinable with sufficient data concerning a number of variables although this presents practical difficulties.

Non-formal education clearly can help, however, reducing the gap between education and employment in various ways.

Efficiency Gap

The efficiency gap is the ineffective utilization of resources --both human and financial. It represents educational waste.

> *The term "educational wastage" includes two main components: (1) grade repetition, which refers to pupils who are held back in the same grade and do the same work as in the previous year, and (2) dropout, or withdrawal from a school cycle before its completion.*[12]

Of about 30 million children enrolled in grade 1 in Asian schools, about 50 percent of them leave before completion of the first year of education. The waste has been estimated at $100 million a year in Asia, and this estimate does not include loss of the value of time spent by the students. In 1960, half the children who entered school in Latin America never started the second grade. Three-fourths dropped out before they learned to read.

Even in the U.S. it has been estimated that one-third of the nation's young people drop out of school before completing senior high school, many without appropriate skills to meet the job demands in

the labor market.[13] This educational investment is a dangerous waste; it tends to create and perpetuate a "vicious circle" described by UNESCO:

> *A high ratio of wastage in an education system constitutes educational deprivation in one of its most acute forms. Since wastage is almost invariably higher among children who belong to socially or economically handicapped classes, existing imbalance between social groups or geographical regions are accentuated and the sections of the populations which most need the socializing influence of education are deprived of it. Since educational attainment is associated with higher income earning capacity, a situation of ever widening inequality of income distribution tends to be perpetuated.*[14]

The main manpower consideration of this waste is reflected in the high unemployment of school dropouts. The mere increase in the rate of economic growth is not going to help the situation very much; even the increase in the number of jobs available is not perhaps the solution because the main problem is that many young people do not possess qualifications required by the employers. They need to learn employable skills. Non-formal training or retraining facilities to provide salable craft skills or any other skills should appeal to both MDCs and LDCs.

Demand and Supply Gap

The demand for educational services has exceeded its supply both in advanced and less developed countries. This demand/supply gap has its qualitative and quantitative aspects. The quantitative aspect refers to the extraordinary growth of the youth population. This will be discussed later on under Population Gap. Here we are concerned with the subjective aspect of the gap which refers to rising expectations of the people and low quality of the education. Both in the advanced and less developed countries there seems to be an explosion of human expectations resulting in an overpowering rise in demand for more and more educational facilities as compared to acute resource scarcities reflected in the shortage of suprly of skilled and well-trained teachers and buildings, scientific equipment, and textbooks. This "crisis of maladjustment" has led to the over-crowded classroom with

utterly inadequate facilities for learning.[15] This tragic human scene is most acute in the case of LDCs where an astonishing proportion of scarce educational resources are being utilized only to produce high rates of "educated unemployed," attrition, and grade repeaters. Professor Coombs depicts this demand/supply gap:

> *Despite the valiant efforts of educational systems to expand (partly because of this) most of them have been unable to narrow the gap between the steadily rising popular demand for their services and their capacity to admit more students and give them a satisfactory education. This is basically because education breeds its own demand, independently of the economy's ability to support it. The youngster of illiterate parents who gets through primary school then wants to go to secondary school (though in Africa, for example, has only a one-in-ten chance making it). The dream of those who do get into secondary school is to go on to the university. The process everywhere works like a series of flood-gates; when the first gate is opened the flood soon washes against the second, and so on until the whole system is inundated. The developing nations that are striving today to achieve universal primary education are unleashing a flood of popular demand that will soon engulf their secondary schools and universities.*[16]

In such a crisis, non-formal education does provide an alternative. Properly planned, it may reduce the magnitude of "the crisis of maladjustment," thereby improving the quality of manpower in terms of its development, utilization, and maintenance. The task before the educational planner is to develop alternative learning systems, subject to constraints imposed by the social environment and resources, and to choose the best combination of learning modes, whether they be formal or non-formal. "The people who are most likely to help him--whether they are economists, philosophers, sociologists--will be those who try to show him how to marry the needs of his particular community to the resources which are entrusted to him."[17]

Population and Cost Gap

The size and magnitude of the demand/supply gap is further compounded by the population explosion. Non-formal education can play its role in the following four components of the population gap: (a) explosion, (b) implosion, (c) diversification, and (d) change.

Explosion.--The explosive population increase in the LDCs is due to two factors: (1) extension of medical and health facilities and consequent reduction of death rates, and (2) maintenance of high birth rates as before.

> *The death rate was cut in half in the United States during the period 1900-1950, when mortality rates dropped more rapidly than at any other time. However, Ceylon required only seven years, just after World War II, to equal that feat . . . life expectation has also increased tremendously in the developed countries, and the same development will accompany the population explosion in the developing countries. In 1850, one-fourth of all persons born in Western countries was dead by age 10, and one-half by age 45. In 1950, one-fourth was dead by age 60 and one-half by age 70.*[18]

The population explosion has led to the tremendous growth of school-age population. In quantitative terms, formal schooling fails to cope with the situation. This failure is reflected not only in terms of the currently increasing rate of illiteracy but also in the rising costs of formal schooling. According to one estimate, school enrollments in the LDCs are increasing in an arithmetic progression 1, 2, 3, 4, 5 (i.e., increasing at a rate of approximately 5 percent a year and doubling in every 14 years), but school costs are increasing in a geometric progression 1, 2, 4, 8, 16 (i.e., increasing at a rate of approximately 10 percent a year and doubling in every 7 years). In Pakistan, for instance, primary education is at present available to half of the nation's children, the number of illiterates is rising in excess of 1 million persons a year.[19] Again, there has been a sharp increase in per pupil expenditure, not all because of the massive expansion of extensive formal education but also because of the desire to upgrade the qualifications of teachers and to lower the student-to-teacher ratio. In Puerto Rico, for example, the income was ten times greater in 1965 than in 1940. School enrollment has more than doubled during this period, while school costs multiplied 25 times.[20] In many less developed countries such as India, Pakistan, and Bangladesh, over 80 percent of the total population is still illiterate; only a tiny minority enjoys the luxury of formal schooling. Non-formal education may offer in many cases, a less costly

and more attainable alternative in the development, utilization, and maintenance of manpower. Once the formal schooling monopoly on education is broken, the cost of education may be reduced to broaden the educational base of the society.

Implosion.--The population implosion, the concentration of population in large urban units, has occurred in LDCs for several historical and contemporary reasons. In most cases colonial powers developed the urban centers in order to funnel raw material and manufactured goods between the colony and home country. Thus cities became the source of white collar jobs and in spite of uneasy atmosphere in the rural countryside because of liberation and invasion operation during the Second World War, the most powerful factors which led to this implosion are twofold. *First*, the wrong type of colonial formal education developed a disdain for manual work in the rural context resulting in migration of rural primary graduates to the towns. *Second*, pressure of population on the land coupled with the breakdown of traditional society and attractions which the town offers--bustle; water out of a tap, freedom from obligations to relatives and chiefs; schools, theaters, hospitals, buses--also resulted in the streaming of unskilled people into the towns. These towns became the centers of squalor, disease, corruption, and delinquency. The big cities such as Calcutta and Karachi are havens of squatters in the night. This is a long-standing phenomenon in almost all LDCs, particularly in Asia. Can non-formal education play some role in such situations? Better opportunities in rural areas may reduce the impetus of migration to the cities. Furthermore, it can offer considerable to those who do emigrate. Both the young primary school graduates and school leavers may be the inputs of non-formal educational output.

Diversification.--Standardized formal education in many cases seems to be inappropriately rigid for the people having diverse racial, ethnic and cultural backgrounds. Since non-formal education may in

many cases provide alternatives, it introduces flexibility for people of diversified backgrounds and cultural values.

Change.--In a changing society, many new jobs constantly appear while many old jobs disappear resulting in "technological unemployment." Non-formal education is perhaps best suited to fill the needs for craftsmen of all types such as car mechanics, secretaries, stenographers, television and radio repairers, watch makers, and business machine operators. On the other hand, it can also provide retraining facilities for the technologically displaced. In the U.S., for example, public retraining courses specifically for adult, experienced workers have been arranged for about a decade under public auspices. Professor Lewis describes the situation vividly:

> *After seven years of primary education, a boy cannot be so easily contained by three acres and a hoe as his father was; if his school was any good, his aspirations must have been raised above this level. Only a reformed agriculture, using modern technology to secure high yields per man, could attract him; but agriculture cannot be reformed as quickly as schools can be built. Furthermore, in a country where only 10 per cent of the children complete primary school, and less than 1 per cent enter secondary school, graduates of primary schools are in demand as clerks and teachers, and can earn several times as much as the average farmer. Primary school is thus established in young people's minds as the road to a well paid white-collar job. When, as a result of crash programs, the number completing primary school is raised within a decade from 10 to 50 per cent of the age group, frustration is inevitable. Graduates of the rural primary schools stream into the towns, where they cannot find jobs; indeed, the simultaneous expansion of the output of secondary schools will mean even fewer white collar jobs than before for primary school graduates. Blame is laid on the curricula of primary schools, but this is hardly relevant; young people's aspirations are determined by past market opportunities rather than by schoolbooks. The problem solves itself with the passage of the years. It becomes obvious that a primary education is no longer a passport to a clerical job in a town, and graduates of rural schools settle down to make the best of the opportunities available to them in the countryside. But they will still find it hard to remain in rural areas if the Government is spending most of its money on developing facilities in the larger towns, and neglecting the rural areas.*[21]

Tables 2, 3, and 4 are presented here in order to demonstrate the magnitude of the problem. They speak for themselves the need for non-formal education. Too, the fact that children are *born* of young and not-so-young adults, literate and illiterate, informed and mostly uninformed, underlines the very important role for non-formal education in the family setting if anything effective is to be done about the population explosion from the "supply" side.

Wage Gap

Modern cities are plagued by the population implosion, rural labor migration to cities or towns. One of the basic economic incentives for such migration is the difference between urban wages and rural income. Professor Lewis indicates the following three factors which cause this difference: (a) the rise of trade unions, (b) a more powerful social conscience among capitalists causing them to share the fruits of progress with their workers, and (c) rise of nationalistic government supporting the claims of the workers against foreign capital. A fourth factor is the very well documented difference in average productivity between the two sectors. Whatever may be the causes of the difference, the wider the gap between rural and urban wage rates, the greater the migration. Many of the migrant laborers retain a "security" foothold in the farm economy and as a

TABLE 2

World Population at a Glance

Year	World Population
1825	one billion
1930	two billion
1960	three billion
2000	seven billion

Source: Department of State, AID, Office of Labor, Washington, D.C., February, 1971, reproduced from *Manpower and Employment Planning in Lower Income Countries*, p. 33.

TABLE 3

Enrollment Trends in Different Areas of the World

	Primary Education		Secondary Education		Higher Education	
	1960	1963	1960	1963	1960	1963
World	140	157	172	210	179	230
Europe	114	119	160	186	161	211
North America	142	153	161	192	157	197
Africa	223	273	271	364	267	345
Western	298	356	388	600	722	1,622
Eastern	210	259	306	449	700	1,083
Middle	203	268	366	641	--	--
Northern	230	291	332	407	302	400
Latin America	175	203	227	325	203	262
Tropical	193	229	255	369	205	280
Middle	186	230	255	401	220	311
Temperate	134	144	184	231	213	255
Caribbean	166	174	199	311	151	180
South Asia	175	204	213	267	240	273
South East	160	181	271	332	179	237
South West	201	249	341	449	179	237
Middle South	181	214	199	250	266	278

Source: Appendix 1, *The World Educational Crisis* by Coombs (New York: Harvard University Press, 1968).

TABLE 4

Populations of Developing Countries Are "Younger," Thus Placing a Heavier Burden of Support on Employable Adults

	Year of Data	Median Age of Total Population	School-Age Population as Percentage of Total Population
China (Rep. of)	1963	17.4	56.0
France	1962	32.9	28.2
Germany (Fed. Rep. of)	1961	34.0	21.4
Ghana	1960	18.3	48.3
India	1961	20.4	46.5
Morocco	1960	19.5	49.4
Nicaragua	1963	15.8	61.7
Niger	1962	18.0	54.4
Sweden	1960	36.5	23.1

Source: Appendix 1, *The World Educational Crisis* by Coombs (New York: Harvard University Press, 1968).

result they accept the low wages, and it is difficult to organize them in a meaningful training program.

> *With the high rate of labor turnover associated with the migrant labor system, it was not possible or worthwhile to select and train indigenous labor for skilled work, even if the mines and plantations were willing to do it. The same person did not stay on the job long enough for the purpose, and the labor supply remained a succession of new recruits. But on the other hand, the migrant labor system provided the mines and plantations with a very convenient stream of casual labor for which they did not need to take much care and responsibility. Most of the workers are adult single males who had left (or were encouraged to leave) their families behind in the subsistence economy. So the mines and plantations did not feel obliged to pay wages sufficient to maintain the worker and his family or to invest in housing and other welfare projects to enable him to settle permanently with his family on the location of his work. Further, during the slumps in the export market, the labor could be laid off and returned to the subsistence sector without continuing responsibility for them.*[22]

In such a situation, non-formal education can help develop manpower in two ways: (a) In the rural sector surplus labor force may be trained and given salable skills. Depending on the local need, a non-formal education program can be arranged to impart training or a skill to permit use of spare time to supplement subsistence income with rising income. (b) The consequent reduced pressure on the urban sector would enable industries to select and train on-the-job indigenous labor for skilled work without the losses associated with the high turnover rate.

Equity Gap

There seems to be general agreement among economists that it is not feasible to provide formal schooling to all people, suggesting a substantial shortfall in the development of human resources. Formal education tends to provide access to power and opportunity. Many poor people are denied opportunity for upward mobility simply because they are denied educational opportunity.

Reimer[23] in his *School Is Dead* argues that school creates social discrimination. No country can provide all the education its people want in the form of schools. The rich tend to be the ones to

go to school, and they stay in school because private costs of schooling increase as it is extended.

We have already noted that in Bolivia it is the upper class which gets the benefit of over 99 percent of the educational expenditures. Most parts of the world resemble the Bolivian case. The current emphasis on the formal education tends to maintain the elite control in the society. This is true of the LDCs but also in the advanced countries as well.

Coombs demonstrates that it is the upper class of Sweden, the U.K., and Japan who benefit the most from formal education.[24] This educational investment in the upper class gives it social prestige and power--a self-perpetuating "vicious circle."

If the cost-benefit and cost effectiveness of various alternative non-formal activities are objectively analyzed; and if in fact, non-formal educational opportunities are shown to be economically expandable, three advantages will emerge:

First, this would broaden the educational base of the society and raise the average level of educational attainment. *Second*, it follows that with the extension of the educational base, discrimination would diminish, tending to reduce somewhat the circularity of the "vicious circle." *Third*, with the increase of the level of educational attainment and consequent reduction of discrimination, the income distribution is likely to be more equal. Evidence indicates that level of educational attainment and discrimination do contribute to income differences.

Using cross-sectional data, several studies have substantiated that the higher educational attainment shows the steeper rise in earning in both advanced countries and LDCs. The earnings profiles in the U.S., the U.K., Mexico, and India are shown in Figure 7 (a, b, c, and d).

In his article, "The Effect of Low Educational Attainment on Incomes: A Comparative Study of Selected Ethnic Groups," Professor Walter Fagel of the University of California provides

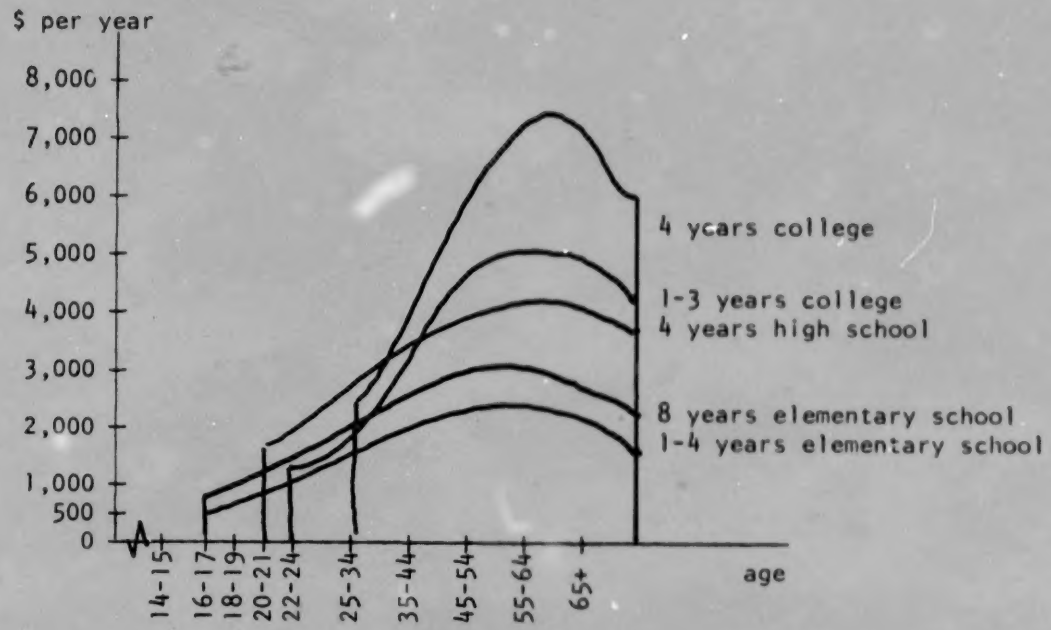

Figure 6A.--Age-earnings profiles in the United States, 1949.

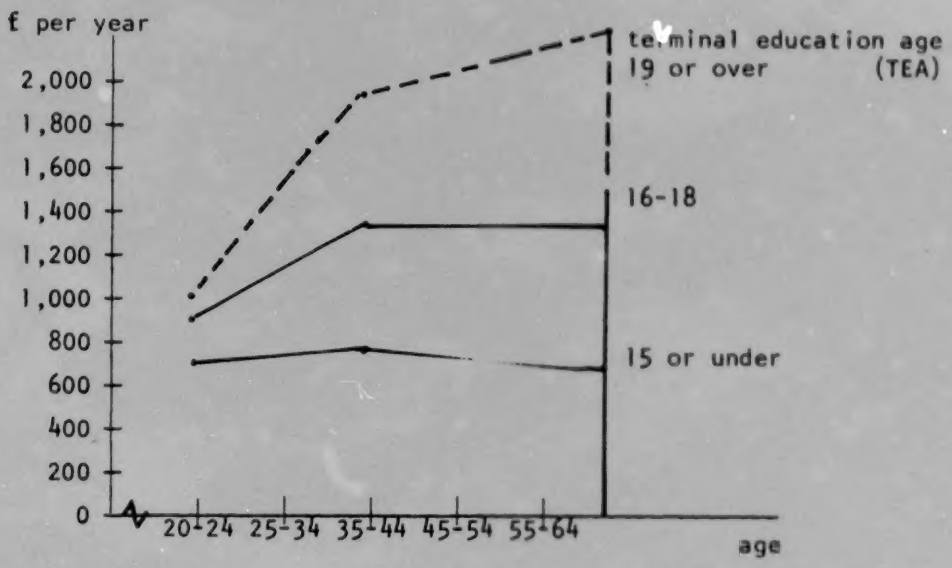

Figure 6B.--Age-earnings profiles in the United Kingdom, 1964.

Note: The sample sizes for each age cohort for the TEA group, 19 or over, are too small to provide reliable results.

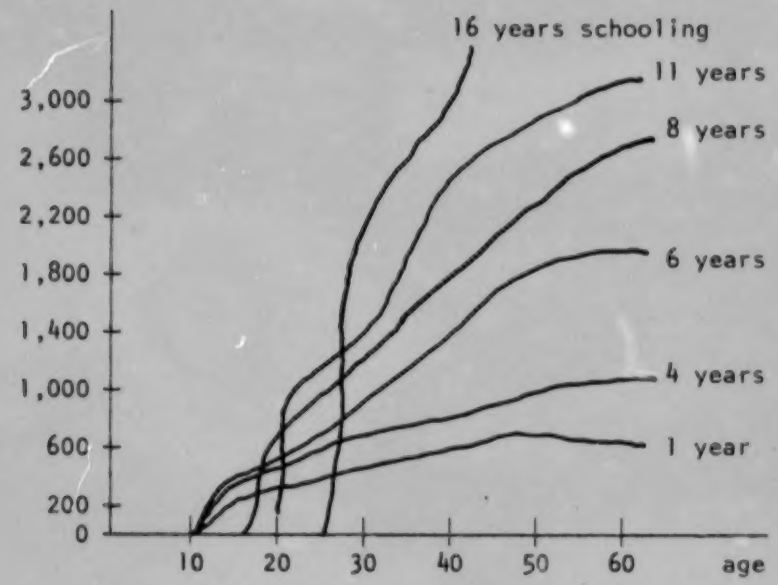

Figure 6C.--Age-earnings prfiles in Mexico, 1963.

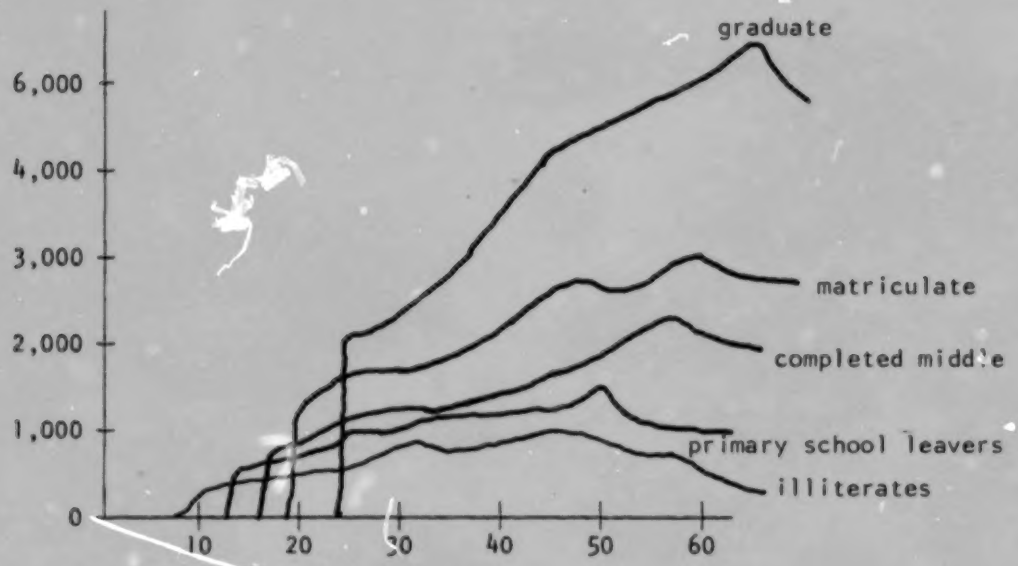

Figure 6D.--Age-earnings profiles in India, 1961.

Sources: 6A--W. Lee Hansen, 1963; 6B--Henderson-Stewart, 1965; 6C--Carney, 1967b; 6D--Blaug *et al.*, 1969. Reproduced from *An Introduction to the Economics of Education* by M. Blaug (New York: Penguin Books, 1972), pp. 24-25.

> *estimates of the importance of educational attainment in accounting, for the income differences between Anglos and members of disadvantaged ethnic groups. Except for the Spanish surname population of the South-West, educational attainment accounted for less than half of the differences between the 1959 median income of each group and that of Anglos. The income differences which remain after adjusting for education were not analyzed, but undoubtedly result from multiple causes, of which educational quality and especially discrimination would seem to be most important.*[25]

Interestingly enough, using survey data from the Tunisian shoe industry to estimate earnings regressions, John Simmons found that

> *primary education has little relevance for the earning of the blue collar workers in the Tunisian shoe industry. Technical and apprentice training has even less validity. What is much more significant than formal schooling for a worker's earnings is his informal education. This is the process of learning by looking and doing what takes place on the job. Also significant in predicting the earnings are behavioral and attitudinal characteristics of the workers. . . . The finding that formal education plays a weak role in the earnings of an African blue collar worker is consistent with a growing body of evidence on American workers. The finding that informal education has benefits which are superior to formal schooling has no direct counterpart in the literature because of less adequate attempts to measure it.*[26]

The point is that provision of increased non-formal education will have a positive impact toward a more equitable distribution of income, thereby contributing to a more egalitarian society.

Adaptability Gap

Formal schooling by its nature requires conformity for its survival. Being part and parcel of a large bureaucratic arrangement, it tends to be inflexible and rigid.

Non-formal educational planning can introduce an element of flexibility into the whole range of educational planning. This flexibility is desirable especially in the rural sector. In dual economies such as Bangladesh, Pakistan, India, and Nigeria, we find integrated or joint farm families where all members of the family contribute to the farming tasks. Structured, formal schooling comes in direct conflict with this traditional pattern of life. In a technological

society, also, the school introduces rigidity, as Reimer argues that "school has become the universal church of a technological society, incorporating and transmitting its ideology and conferring social status in proportion to its acceptance by the people involved."[27]

Present day formal educational programs tend to be highly structured and rigid. As Bowman indicates:

> *The fixed factor approach in manpower planning is part of the rigidifying view of school systems and certification that blocks experimentation and innovation in institutional arrangements for human resource development and in efforts within existing agencies and institutions. Partly, this problem is associated with the pre-occupation with schools as the agencies for human resource development. But it is a matter also of arrangements that discourage creative endeavors in which students and faculty participate to overcome obstacles and solve problems.*[28]

Non-formal educational programs tend to be heterogeneous and to have a variety of sponsoring organizations. This might imply a lack of central direction and control typical of formal education and a relationship to a large bureaucratic organization such as the ministry of education. Non-formal educational programs tend to be more adaptable to educational innovation and change. Non-formal education programs need not be uniform throughout the country. Conditions may differ from one part of the country to another. Non-formal programs should develop to meet specific needs in specific situations, and they should disappear once the need is satisfied. These programs may be short or long in perspective depending on the objectives. These characteristics afford greater opportunity for innovation and experimentation than usually permitted in formal schooling. Thus, the investment in non-formal educational programs may be seen in terms of greater flexibility in and adaptability to the social and institutional framework--increasing receptivity and adaptability to change. This would permit more appropriate response to the educational needs of emerging nations. Thus, non-formal education can both complement and substitute for formal education in human resource development.

Evaluation Gap

The evaluation gap arises because of the difficulty in assessing the individual's performance on the job. In a rapidly changing U.S. society, for example, the skill of the supervisors becomes relatively out-dated through time, whereas the skills of the supervised are relatively up-to-date. This "up-to-dateness" gap is likely to result in serious weaknesses in evaluations. Experience garnered by senior supervisors is undoubtedly an asset for the enterprise, but there is a need for adequate retraining or in-service training so that supervisors can be effective. Eli Ginzberg, a leading economist in the area of manpower development, expressed the problem of accelerated obsolescence of skill in the technological society in the following words:

> *Promotions in large organizations depend primarily on years of service. A man becomes a vice-president or president of a large organization in his late forties or early fifties. In a rapidly advancing scientific and technological society men get close to the top when they are already obsolete. At least it is likely that their knowledge of the science and technology on which the company's future depends will be out-of-date. Recently, at least one large American corporation has perceived this danger, and has taken steps to retrain its senior technical personnel who hold important managerial positions.*[29]

This evaluation gap may be even more complex in the LDCs because foreign supervisory personnel know too much of the skills of their highly technological societies and too little of the characteristics of indigenous skills and experience. Non-formal education has an understandable appeal in modifying both the indigenous and foreign skills into closer synchronization.

Expectation Gap

Non-formal education can reduce the expectation gap in its different dimensions. In poor countries this gap is reflected in migration from rural to urban areas in search of jobs which are frequently not available. Further, some labor markets are inundated with "educated unemployed" or "semi-educated unemployed." For example, the

Indian Institute of Applied Manpower Research has estimated that the number of "unemployed educated" persons in 1975-76 will about *equal* the total stock of educated persons in 1960-61.[30]

Further, this situation is not reversible. The "educated" acquire prejudices, tastes, and objections concerning manual work and rural endeavors which effectively prevent them from participating in many sectors of the labor market.

Dissatisfaction occurs, too, in affluent sectors because of the number of available options. An excess of opportunity or options is apparently as frustrating for the rich section as its lack is frustrating to the poor.

Non-formal education could help reduce this gap in two different ways in the rich and poor societies. In the rich community non-formal education can conceivably increase the adjustment of people from one option to another through systematic training and retraining programs. In the poor communities, non-formal education can assist in acquiring a salable skill through the effective utilization of formal education or in substitution for it. Flexibility in the provision of one or two additional options can thus be provided. Such flexibility permits the individual within some limits to exercise options according to his level of aspirations and performance.

Policy Implications

Non-formal education can play a crucial role in the process of total human resource development. This implies the desirability of a conscious policy for the selection and implementation of the non-formal education programs. There are three choices:

(a) Maintenance of the status quo by giving further emphasis to formal schooling;

(b) Switching over to non-formal education in total disregard to formal schooling;

(c) Combining (a) and (b) hopefully in some sort of optimal ratio elected on the basis of cost-benefit (or some other) analysis.

The first two are extreme alternatives, and both are likely to produce the same result in maintaining elite control in the society.

The rich are most able to buy education, whether formal schooling exists or not. It is generally found that the son of a doctor, teacher or manager, has more chance of participating in higher education and later achieving a high social position than the son of a peasant or worker. "Often this phenomenon--whose existence no one can dispute--is given too little or no weight. However, it is only by becoming fully acquainted with it, in its most inmost mechanism, that it will be possible to combat it most effectively."[31]

Universal primary education was becoming an expensive fad in the LDCs, and disproportionately large investments were made in higher education available only to the middle and upper classes. A high dropout rate, brain drain, unwillingness of specialized personnel to work in the rural context, desire to migrate to cities with just a little formal education, workers' unrest are (among other results) indicative of the failure of formal education. What is needed is an array of options with opportunities for the poor to participate in education.

But choosing a combination of formal and non-formal education is a crucial issue for the LDCs as well as for industrial states. One can learn how to read and write either in the home or in schools; automobile mechanics can be trained in a vocational training school or in a neighborhood garage; employed personnel may improve the quality of service by receiving in-service training within factories or in formal schools; the dropout rate can be minimized either by increasing the holding power of the school which involves school reform or by imparting effective and useful non-formal education to dropouts, self-awareness of the illiterate adult population can be developed through radio, television, or through formal night schools. Task oriented education can be arranged either in school, on the job, or elsewhere.

Which way to go? Which policy to implement? This is the dilemma of the planners, administrators, and leaders who are supposed to know the needs and aspirations of the society. The willingness of

the community or its leaders to implement non-formal educational programs can be measured ultimately in terms of taxes and expenditures.

In developing a non-formal educational program, educators cannot simply rely on economists' tools of analysis. They shall have to take account of the sociologists' views of society, anthropologists' views of man and his culture and political scientists' views of political institutions in a given society. Some variables are quantifiable and some are not. No doubt some views will be inconsistent with others; values differ. The task is not easy, and the methodology yet developed will yield no single neat answer. But the hard fact finally remains: a single decision must be made for better or worse, by someone. Lastly, it is essential that advisors on educational planning recognize that in many LDCs there is a tendency to build schools to placate political constituents without taking into consideration manpower needs. It is a visible act associated with higher incomes and near-universal middle-class values, while non-formal educational programs may be invisible or at least much less visible. Not only in this field do political conditions lead to misallocation of resources.

Summary and Conclusion

We have discussed nine "gaps" which non-formal education can directly or indirectly serve to ameliorate. These gaps are interrelated and in some cases even overlapping, and they make clear the nature of the environment which non-formal education is supposed to modify. With this general comment, let us summarize the meaning of the different gaps: (1) The *job gap* refers to misfit of education with job requirements. (2) The *efficiency gap* refers to the lack of proper utilization of resources--human and financial. (3) The *demand and supply gap* refers to the rising demand for education and the consequent low quality of education. (4) The *population gap* refers to failure of formal schooling to cope with the growth of school-age population. (5) The *wage gap* refers to the higher wage rate offered by the urban sector resulting in rural migration to cities. (6) The

equity gap implies that formal schooling does not offer educational opportunity to all; only the privileged to to school and they participate longer as costs increase with the level of education. (7) The *adaptability gap* refers to the rigidity in the schools which makes it difficult for them to respond to social and economic needs. (8) The *evaluation gap* arises because of difficulty in assessing individual performance on the job since workers' skills are likely to outrun supervisors' skills. (9) The *expectation gap* is reflected in migration from rural to urban areas and the pursuit of education in search of jobs which are frequently not available.

Planning of the non-formal education sector can offer more than an alternative. Non-formal education, because of its diversity, is a dynamic factor in human resource development. Formal schooling cannot, perhaps, introduce this dynamic element because of its emphasis on maintenance of the status-quo, tacitly supporting elite control in the society.

Successful non-formal educational plan implementation greatly depends on the quality, realism, and practicability of the plan itself. Even the most well conceived and soundly based plan may not attain its objectives if there are substantial lags in the arrangements established for their implementation. A "solid" plan may be evolved by a small, well trained and experienced group, but its implementation may involve the active participation of the whole administrative structure, the private sector, and other social and economic institutions. This is another case where "theoretically good" fails to be equivalent to "practical reality."

Lastly, in a highly structured society such as the U.S., it is difficult to sell the non-formal educational output partly because of anxiety, partly because of uncertainty, and partly because of a certificate-oriented value system which has long since gained currency. The situation is different in the case of less developed countries where we find economic and social dualism. Its peasant sector is essentially based on an agrarian subsistence economy providing very few educational opportunities to the people. I have a

feeling that it is relatively easy to sell the non-formal educational output in such a sector especially because there is little or no formal schooling system in this sector. On the other hand, in the more organized industrial and modernized sector of the less developed country, we find a relatively developed formal schooling system similar to that of the Western countries. This is at once an advantage and disadvantage to the introduction of non-formal education into the system. It is an advantage because the failure of formal schooling has challenged the foundations of the system in most of the less developed countries in Asia and Latin America. This is also a disadvantage because the tendency to imitate in the LDCs is strong, and they have tended to think of education only in terms of what is dispensed by the formal schools; and this has been intensified by the role of the foreign advisors who are, in most cases, imposing on the governments their preconceived notions. This makes the whole thing complex. But the so-called "crisis" in contemporary education with its many crucial issues has already given a stimulus to serious inquiry. Herein lies the hope for non-formal education.

NOTES: CHAPTER II

1. M. J. Bowman, "Perspectives in Education and Development," in *Human Capital Formation and Manpower Development*, ed. by R. A. Wykstra (New York: The Free Press, 1971), pp. 425-34.

2. *Ibid.* Arrow is paraphrased by Bowman, p. 431.

3. Elasticity means relative measure of the responsiveness of one variable to change in another. Similarly when the price, Px of a commodity x influences the quantity demanded Qy, of another commodity y, the cross-elasticity of demand can be defined as

$$\frac{\frac{Qy}{Qy}}{\frac{Px}{Px}} = \frac{Qy}{Qy} \cdot \frac{Px}{Px} = \frac{Qy}{Px} \cdot \frac{Px}{Qy}$$

where Δ = increments/change, Px = price of commodity x, Qy = quantity demanded of commodity y.

4. Allan J. Braff, *Micro-Economic Analysis* (New York: John Wiley and Sons, Inc., 1969), p. 17.

5. We can compute the marginal costs either from variable costs or from total costs.

$$\text{Average total cost (ATC)} = \frac{\text{Total Cost (TC)}}{\text{output}}$$

$$\text{Average variable cost (AVC)} = \frac{\text{Variable Cost (VC)}}{\text{output}}$$

$$\text{Average fixed cost} = \text{ATC} - \text{AVC}$$

6. *International Labour Review* (September, 1969), pp. 239-45.

7. W. Arthur Lewis, "Education and Economic Development," *International Social Science Journal*, Vol. XIV, No. 4 (1962), pp. 685-99.

8. Frederick H. Harbison, "Human Resources Development Planning in Modernizing Economics," *International Labour Review*, Vol. LXXXV, No. 5 (May, 1962), pp. 2-23.

9. Daniel H. Kruger, "The Training of Youth-Community Responsibility," School of Labor and Industrial Relations, Michigan State University, East Lansing, Michigan 48823.

10. P. H. Coombs, "Time for a Change of Strategy," *Qualitative Aspects of Educational Planning*, ed. by C. E. Beeby (Paris: UNESCO, 1969), Chapter 1.

11. J. Maton, "Experience on the Job and Formal Training as Alternative Means of Skill Acquisition: An Empirical Study," *International Labour Review* (September, 1969), pp. 329-45.

12. UNESCO, "Educational Wastage," in *Development Digest*, USAID, Vol. VI, No. 1 (January, 1968), p. 75.

13. Daniel H. Kruger, "School Dropouts--a Tragic Manpower Problem," Labor and Industrial Relations Center, Michigan State University, East Lansing, Michigan 48823.

14. UNESCO, "Educational Wastage," *op. cit.*, pp. 75-77.

15. P. H. Coombs, "Time for a Change of Strategy," *op. cit.*, Chapter 1.

16. *Ibid.*

17. C. E. Beeby (ed.), *Qualitative Aspects of Educational Planning*, UNESCO, International Institute for Educational Planning, 1969, p. 108.

18. Philip M. Hauser, "World Population Perspectives and Economic Development," in *Manpower and Employment Planning in Lower Income Countries*, Department of State, AID, Office of Labor Affairs, February, 1971, pp. 33-34.

19. *The Four Five Year Planning 1970-75 Planning Commission* (Islamabad: Government of Pakistan, July, 1970), p. 145.

20. E. Reimer, *School Is Dead* (Garden City, N.J.: Doubleday and Company, 1971), pp. 21-30.

21. W. Arthur Lewis, *Development Planning: The Essential of Economic Policy* (New York: Harper and Row, 1966), pp. 79-80.

22. Hla Myint, *The Economics of the Developing Countries* (New York: Praeger, 1964).

23. Reimer, *op. cit.*, pp. 21-30.

24. P. H. Coombs, *The World Educational Crisis* (New York: Harvard University Press, 1968), pp. 190-91.

25. Walter Fagel in *Human Capital Formation and Manpower Development*, ed. by R. A. Wykstra (New York: The Free Press, 1971), p. 383.

26. John Simmons, *The Income Benefits from Formal and Non-Formal Education*, estimates for a socio-economic model, Economic Development Report No. 211, April, 1972, The Center of International Affairs, Harvard University, p. 2.

27. Reimer, *op. cit.*, p. 30.

28. Mary J. Bowman, "Perspective on Education and Development," in *Human Capital Formation and Manpower Development*, ed. by R. A. Wykstra (New York: The Free Press, 1971), pp. 425-34.

29. From "Man and Work," by Eli Ginzberg, Graduate School of Business, Columbia University, New York, no date.

30. See Institute of Applied Manpower Research, Working Paper, No. 11 (New Delhi: 1965), Part IV, p. ii.

31. UNESCO, *Economic and Social Aspects of Educational Planning* (Paris: 1964), p. 105.

CHAPTER III

INVESTMENT CRITERIA IN NON-FORMAL EDUCATION

Introduction

Investment in Human Capital: Its Nature

Capital is frequently defined as "produced means of production" in an effort to distinguish it (1) from non-reproduced and non-reproducible factors such as land and (2) from produced goods to be utilized entirely for consumption. Conceptually, there is little problem in this, but there are severe problems in utilizing operationally so simple a definition. Classical, traditional economists viewed people as one of the three factors of production--land, labor, capital--and *their* consumption as the end purpose of economic activity. Thus, labor was considered separately from capital although very early it was discerned that labor ought not be treated analytically as a homogeneous factor, and little attention was given until recently to the economics of expenditure on the improvement of "*homo sapiens*" as a *capital expenditure*. The prevailing tradition, the difficulty of isolating investment from consumption, and the moral implications of viewing human beings as capital discouraged complete acceptance of the human capital concept.[1] Economists considered men as the ends of economic activity, not--except in the case of slavery--as capital goods, a form of wealth augmentable by investment. A few classical economists such as W. Petty, Malthus, Adam Smith, Marshall, and Fisher emphasized the need for investment in human capital by noting that

> *(1) there were costs associated with the development and formation of human capital (largely education), (2) the output of skilled human resources added incrementally to the national product, and (3) expenditures on human resources which increased the national product also increased the national wealth.*[2]

Only recently, in the early 1960s, economists such as Schultz and others have rediscovered the importance of human resources and have pointed the way toward incorporating investments in education into the mainstream of economic analysis. Thus, current interest in the economics of investment in education ". . . reflects the general concerns of economists and educators: The economic efficiency implications of rapidly growing expenditures in the education industry and the relation of human capital to economic growth and development."[3] There seems to be a consensus among economists on the need for human resource development.

Broadly speaking, human resource development is the process of increasing knowledge and the critical skills of all the people in a society. In socio-economic terms, it is the accumulation of human capital for social and economic advancement. Human resources are developed by formal education, through systematic non-formal training programs in employing institutions or training on the job, in adult education programs, and through membership in various political, social, cultural and religious groups, or within the family, as well as by the process of self-development. How can we estimate the volume and magnitude of human investment? Schultz[4] maintained that "the practice followed in connection with physical capital goods is to estimate the magnitude of capital formation by expenditures made to produce the capital goods." This practice would suffice also for the formation of human capital. However, for human capital there is an additional problem that is less pressing for physical capital goods: how to distinguish between expenditures for consumption and for investment. This distinction bristles with both conceptual and practical difficulties. We can think of three classes of expenditures: expenditures that satisfy consumer preferences and in no way enhance the capabilities under discussion (these represent pure consumption), expenditures that enhance capabilities and do not satisfy any preferences underlying consumption (these represent pure investment), and expenditures that have both effects. Most relevant activities clearly are in the third class, partly consumption and partly

investment. Thus, the task of identifying each component is formidable, and the measurement of capital formation by expenditures is less useful for human investment than for investment in physical goods. In principle, there is an alternative method for estimating human investment; namely, by its yield rather than by its cost. While any capability produced by human investment becomes a part of the human agent and hence cannot be sold, it is nevertheless "in touch with the market place" by affecting the wages and salaries the human agent can earn. The resulting increase in earnings is the yield on the investment.

The difficulty of separating investment from consumption expenditure exists both in formal and non-formal education. The outputs of both are intangible in nature but there is a significant difference between investment in formal and non-formal education which tends to make the conceptual problem a bit easier for the latter. Formal schooling generally involves a long gestation period and furthermore is general in nature rather than a job or task specific. Non-formal education on the other hand frequently produces an output to be used immediately and in a specific task. This makes the identification and analysis much easier.

Investment Criteria

"Investment" criteria in education are important because program *evaluation* is a principal component of the economics of education, formal or non-formal. It is an aspect of education not properly appreciated in the LDCs.

Public expenditures in education--formal and non-formal--vary between countries from as little as 2 percent of GNP to as much as 6 percent. But this is not of immediate concern. The issue to be examined here is not the *shortage of resources* but rather that of their *management*. A prime example of this is performance of investment in education in, for example, Bangladesh, Pakistan, and Thailand, which creates a paradoxical shortage-surplus problem. There is a shortage of labor with "critical" skills but a surplus of persons highly trained for whom no positions exist.

The fundamental problem is not the lack of resources but rather their proper *allocation* and *management*. Basically, this involves evaluation--estimation of the desirability of utilizing specified amounts of resources in given programs whether they be formal or non-formal programs. This involves the appreciation and proper application, however difficult, of various investment criteria (e.g., cost-benefit analysis).

But "the manpower approach is frequently utilized as a practical substitute for the more intellectually respectable returns approach."[5] It is true that through application of this approach, it may be possible to determine with much precision the non-formal educational need of the different sectors of the economy such as agriculture. This given target of agricultural growth, the manpower need of the sector such as extension agents, agronomists, etc., may be determined. But we cannot avoid the problem of costs and benefits estimations. Thus, Professor Hunter comments:

> *The target for an expansion of agriculture (or manufacturing) implies a decision about priorities and allocation and measurement of various expected results against national goals. The development of certain targets for agriculture, for industries, for public transportation implies some analysis of expected costs and expected returns. This may be done explicitly with careful attention to costs and expected returns or it may be done "hopefully."*
>
> *The manpower approach at best gives the impression of precision and produces exact numbers, and it appears to take a direct route to responding to the appropriate questions. But it really can not avoid the comparison of costs and returns.*[6]

It is now evident the proper application of investment criteria in education is of supreme importance, because education as a sector of the economy has to compete for funds with other sectors of the economy.

The objectives of this chapter are:

(a) to provide a conceptual basis for cost-benefit components and cost-effectiveness analysis as applied to non-formal education;

(b) to examine various investment criteria as applied to education;

(c) to consider the suitability of the investment criteria with particular reference to LDCs.

Conceptual Problems of Cost Estimation

The conceptual and methodological issues involved are several and divisible as follows:

(a) opportunity costs,

(b) fixed, variable, and marginal costs,

(c) external costs,

(d) shadow prices, and

(e) joint costs.

Opportunity Costs

Costs were viewed historically by the classical economists[7] as "real" costs or production in terms of producers' efforts, sacrifices, or disutilities. "Real" costs were unrelated to consumer preferences or tastes. On the other hand, the neo-classical Austrians held that the cost or value of resources used (with a given supply) was essentially derived from market demand, independent of the "real" cost experienced by the producer. This is an important distinction since it leads to a view of costs as stemming from the prices of productive factors in their various uses. That is, costs are the sum of the factor prices which, in turn, depend upon whatever it is they can earn in the various activities in which they participate. Thus, Austrians[8] viewed costs as real costs of forgone resources rather than merely "money" or "funds" being used. Economists speak of this as the *social opportunity costs* of a resource in a particular use which is equal to what the resource could earn elsewhere or the maximum value of its contribution forgone by using it in a particular manner. The cost of an educational program can helpfully be considered from this viewpoint.

An example may make clear the distinction between "money" costs and "opportunity" costs. Suppose several intellectuals are employed at $2,000 per year to teach in a foreman training class. If

there is a surplus of teachers at this rate, those in excess would otherwise be unemployed or work as common laborers at $400. The money cost of their employment is $2,000, but the opportunity cost is only the value of what they otherwise would have earned (produced), i.e., $400. Thus opportunity costs may be interpreted in terms of what a worker would produce elsewhere (i.e., his marginal product) or in terms of what he could earn elsewhere.

Khatkhate[9] points out that when opportunity cost is defined with reference to marginal productivity, the principle requires full employment of resources which, in its turn, implies utilization of all alternative sources of resources. But when interpreted in terms of alternative earnings, "the principle of opportunity cost becomes applicable to situations of unemployment, under-employment, and disguised unemployment and at any level of marginal productivity." The alternative earnings of labor are determined by "alternative compensation" and "alternative consumption" from the viewpoint of employer and society, respectively. Interpreted thus the social opportunity costs would be zero if the newly employed worker was willing to work at his previous level of consumption whereas alternative compensation of labor is always positive if the worker is even hypothetically employable. This resultant divergence may have underestimated the need for labor intensive techniques in LDCs.

It is extremely important to understand the implications of opportunity costs (i.e., benefits forgone and vice versa), but this is not simple since there are areas in cost analysis which involve more than just straightforward cost accounting. Stromsdorfer[10] identifies two particular problems (capital cost and joint costs) for which major problems of measurement exist.

Capital costs cause problems because they are incurred at one point in time but their services are utilized through a long period--several accounting periods. The "value" of these services to be imparted as costs in each accounting period is the issue of capital costs, and Stromsdorfer identifies four means of valuing the capital *stock*, especially the physical plant and buildings assuming they

existed prior to the beginning of the program being costed: (1) if there is no alternative use, there is no social opportunity cost, (2) historical costs may be used, (3) replacement cost may be used, and (4) some current assessed valuation may be used. Once a particular valuation is selected, then the capital cost for the accounting period is determined by some one of several "depreciation" techniques which tries to estimate and take into account the portion of the assets "used up" in the period. Different methods of asset valuation are used depending on the purposes for which data are sought; the law, standard accounting techniques, and personal biases similarly determine different depreciation techniques which are employed. Both procedures are ultimately *arbitrary* and burden the ultimate *cost figures* with their arbitrariness.

Joint costs arise when a specific facility contributes to the production of two or more outputs; even in some cases the same output in different time periods. A building may serve one group in the morning (primary school), a secondary school in the afternoon, and five different non-formal education groups in the evening. How does one allocate or impute the known total cost to each of the seven programs? This is no new problem, either, nor is it unique to education. Its solution again involves an arbitrary element, but this cannot be avoided since ultimately "costing" must be done if competitive programs are to be evaluated in terms of these costs and returns. Stromsdorfer summarizes as follows:

> *Even if the true economic value of the capital resources in use has been measured, the problem still remains as to the measurement of the rate at which the given capital stock is used up over the course of the investment process when more than one cohort of subjects employs the capital stock. Two courses of action have been suggested for use. One is to attempt to measure an imputed rent to the capital stock by making analogies with respect to what amount of rent (i.e., return on the capital investment) the capital item would yield if it were being employed in its next best alternative use. But such a technique is subject to a great deal of arbitrariness and uncertainty.*
>
> *In order to get a measure of the rental opportunity cost it is necessary to go to the market place and attempt to*

identify capital resources which represent alternatives to the resources employed. This will allow one to determine the value of foregone alternatives. But, again, any imputed rent based on market observations will most likely overstate the value of the committed capital, since it is unlikely that the capital on which the rent imputation is based will be a perfect substitute for the educational capital in question. Thus, a great deal of judgment is involved in adjusting the observed market prices so that they more closely reflect the true opportunity costs.

An alternative technique for estimating the rate of capital use lies in employing the "capital recovery factor." The application of this technique automatically accounts for rent.

The major problem with the capital recovery factor is that it only states the level annual return (rent) needed to recoup the principal and social opportunity cost, that is, interest, given the life of the capital in question. The actual amount of capital used up in any given year could be the same, more, or less than this amount.

In conclusion, however, it must be noted that physical capital costs are usually low relative to all other opportunity costs. Thus, the relative error or bias which can result from the use of an inappropriate measurement technique may often not be large.[11]

The question of cost measurement can be further complicated by noting the theoretical need to incorporate leisure in calculations of costs. Earnings forgone are a part of the cost of education, but so also is leisure forgone. How, if at all, can leisure be valued? "One way to pay for education may be to take less leisure than would have been taken had the individual taken a job not involving education."[12] However justified may be the incorporation of such costs, practicality makes this nearly impossible.

Fixed, Variable, and Marginal Costs

There are good reasons to distinguish between fixed, variable, and marginal costs of a program.[13] The fixed costs are those costs whose magnitude does not vary with the level of output, at least within some reasonable range. For example, the rent of an adult education center would likely be constant whether the center is running at half or full capacity. Variable costs are the sums of the amounts spent for those inputs which do vary with output. The cost of chalk used,

for example, would be directly related to the amount of teaching done (although not necessarily to the number of students). If there is zero output, no units of the variable inputs need be employed (e.g., use of TV time). Summing variable costs and fixed costs provides total cost. As shown in Figure 7, TC and TVC are parallel graphically, in the sense that the slopes of the two curves are the same at every output point. At each point, the two curves are separated by a vertical distance of $100, the fixed cost of the program.

Richard Judy notes the following:

> *If we accept the opportunity cost concept, we become solely interested in costs that are avoidable. If there are fixed costs that must be incurred irrespective of which alternative is selected, those fixed costs have no place in our cost-benefit comparisons of alternatives. This is true even if our budgeting must provide for total including fixed costs.*
>
> *Closely related to the idea of avoidable costs is that of incremental (or marginal) costs. If we are costing an expansion or contraction of an existing program, it is important not blithely to assume equality of average unit costs (AUC) and incremental costs (IC). For various reasons (e.g. economies of scale, fixed facilities in the short run), there may be considerable difference between AUC and IC.*
>
> *My limited observations of cost-benefit analyses in the field of manpower retraining and vocational education lead me to conclude that incremental costs are not measured. I know that the better known studies of costs in higher education concentrate their attention only on total and average costs. The implicit assumption of these studies seems to be that costs are a linear and homogeneous function of the number of students educated. The results of our own studies are not consistent with this assumption.*[14]

It seems that Professor Judy is working under the implicit assumption of equal fixed costs for alternative programs. If this is not correct, then fixed costs have to be taken into consideration in cost-benefit comparisons of alternatives.

Careful analysts are, however, aware of the existence of "spill over" costs--sometimes referred to as "external costs" arising out of the phenomenon of "externality."[15] This situation arises when the implementation of a program results in costs associated with the program but not borne by it. The inauguration of a non-formal

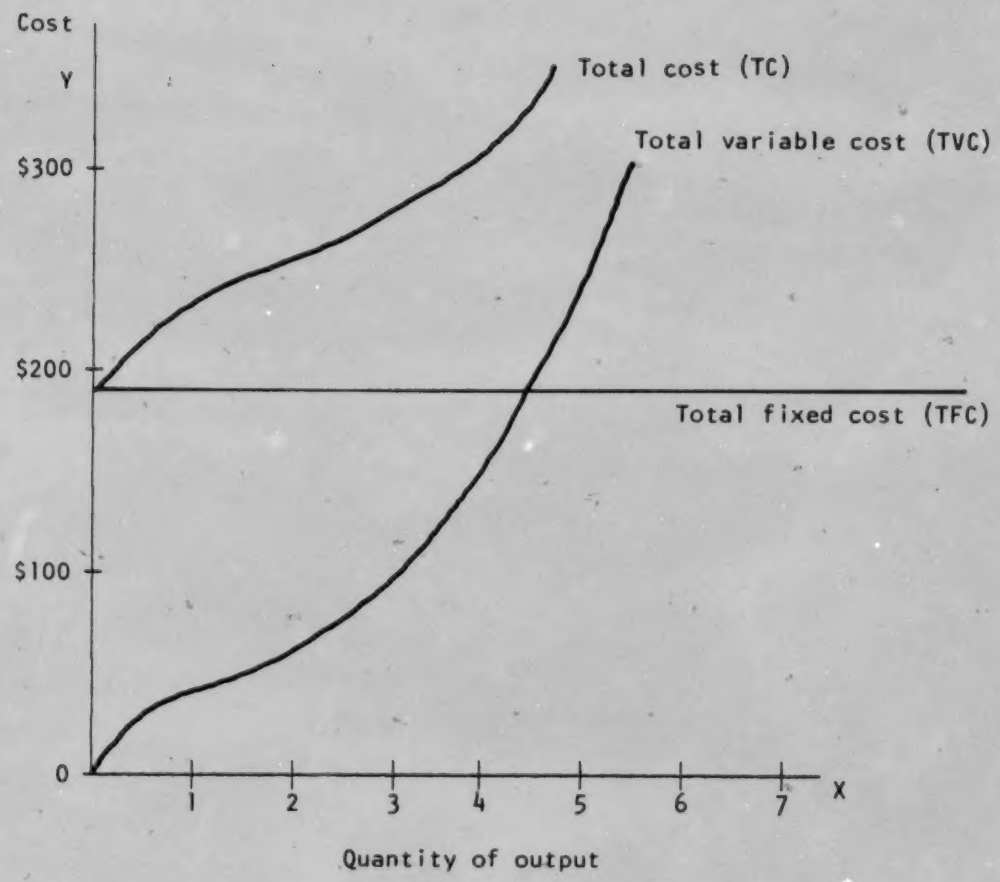

Figure 7.--Relation between TC, TVC, and TFC.

mechanic's training center in a small community might so increase the demand for potential teachers that their wages would rise to include wages of those teaching in the formal vocational high school. In this case, the cost of the non-formal program is appropriately not only the sum of its input costs, but also the increased costs of previous instruction in the formal program. External costs vary greatly in importance and difficulty of estimation. It is important to be alert to their existence and to estimate them when they seem likely to be significant.

Shadow Prices

A clear distinction between market and shadow prices is necessary for proper estimation of costs of non-formal educational programs. Market prices occur when a free exchange of a good or service establishes a price. These prices are explicit, but under some circumstances these explicit market prices may not adequately best serve the purposes at home, and "shadow prices" are used instead.[16] In imperfect markets, where there are constraints on resource use, market prices may not accurately convey information concerning substitution possibilities. Suppose, for example, that teachers are highly unionized, that they bargain collectively, and that they restrict entry into the profession. The market price might be 10,000 monetary units per month, but some portion of this represents the return from the exercise of monopoly power rather than the value of resources forgone in other uses. Thus, a shadow price might appropriately be used by a government or implementing agency seeking to achieve economic efficiency. Thus, "shadow prices" are those prices substituted for market prices when there is good reason to think the substitute more adequately represents the "cost" than the market's evaluation. They are frequently used, too, when "artificial" exchange ratios obtain. Suppose, for example, that television sets are to be imported from abroad for a non-formal educational project in Bangladesh. At the official rate of exchange they are valued at 1,500 rupees each ($200 U.S. x 7.5 rupees, the 1973 official exchange rate). Now if a dollar in fact is worth 12 rupees,

then each television set at the more realistic exchange rate is 2,400 rupees each ($200 U.S. x 12 rupees). Costing the program might very well substitute the "shadow" price of 2,400 rupees per set for the "actual" price paid if the cost to society is what is being examined.

According to McKean, shadow prices may be derived through:

(a) programming techniques which highlight appropriate substitutions;

(b) the prices of similar goods within internal and international markets;

(c) the prices used by other governments for similar goods; and

(d) adjusting market prices to allow considerations which are not reflected in market prices.

The fact is that any set of prices used for the purpose of benefit cost analysis will be imperfect. What is most important is to ask which set of prices is best and most easily obtained. Market prices have the great advantages of *existing* and *being objective*. Shadow prices by their very nature are subjective and arbitrary. It is clear that their use should be restricted to cases in which market prices are clearly inappropriate and in which the direction and magnitude of the "connection" is known.

Joint Costs

The existence of joint costs immensely complicates cost estimations since joint costs involve two or more objectives being *inseparately* served by the same process. A set of learning materials, for example, might serve for vocational high schools, teaching training, and non-formal tool maker programs. How does one allocate the total costs of the preparation of the materials among the three separate programs? There are devices of varying degrees of arbitrariness and sophistication for making such allocations. But, in the end, they are estimations involving arbitrary allocations, frequently leaving much to be desired with respect to accuracy.

This sums up to the fact that it is hardly possible to estimate costs of any non-formal educational program with certainty. The

existence of non-predictable and non-controllable variables makes the cost estimations complex. Some sets of problems would be alleviated if only we had probability estimates for the variables.

We turn now to benefit estimation, a concept more difficult to deal with in theoretical and empirical terms than are costs.

Conceptual Problems of Benefit Estimation

Benefits of a program depend ultimately on its success in meeting its objectives. Measuring those benefits depends, in turn, on a clear statement of objectives in quantifiable terms and a means of valuing those outputs. The problem is the same conceptually for either formal or non-formal educational programs, but the former have a short-hand standard in terms of "years of schooling" which frequently permits the avoidance of defining objectives and measuring successes. Objectives may be cast, for example, by national constitutions in terms of "six years of free schooling for each child" which has meaning only if the content of each year is defined. There is a general understanding that a day is X hours of instruction (each of which is *assumed* to accomplish *something*) and that y days constitute a school year. It is clear that this use of the short-hand "measure" really is a device to avoid measuring output at all since it depends solely on the enumeration of the input to be altered by the productive process.

Non-formal education is so varied in format and delivered in such a non-standard package that no short-hand definition of objectives is possible. Objectives can be considered on two levels. The first involves conceptualization and would involve specific statements about what is expected to occur to the person subjected to the training. It might be designed to convert mechanics into master mechanics (the two being distinguished somehow) or to make foremen of line labor or to improve the capacity of the chicken grower by 20 percent. It is possible to imagine, at least, that values might be put on these accomplished objectives in one way or another. The social objectives sought are much more difficult to handle since they usually incorporate one or more of the following:

1. greater *allocative efficiency* seeking an efficient educational and manpower program in terms of training, mobility, placement; thereby reducing the job gap between employment and education;
2. enhanced *economic stability* and lessened unemployment, thereby reducing social tension and population gap;
3. improved *distributional equity* so as to provide equal educational opportunity, to shift the distribution or income in favor of the disadvantaged, thereby reducing equity gap.[17]

Benefits from educational investment are by nature intangible and take on different values depending on the point of view--that of the employing institution, the laborer, government, or society. The root of the problem arises out of a clash of interests which are fundamental and opposed.

Even if these sets of problems to costs and benefits can be solved and reasonable estimates of each can be made, additional problems confront the decision-maker (although he has surely made great progress). These problems arise from the selection of the *best* use of *limited* resources among several alternatives. In order to get at this matter of choice, the following are needed:

1. specification of objectives as far as possible,
2. determination of the constraints--financial, legal, and administrative,
3. elaboration of feasible alternatives,
4. measurement of costs and benefits of feasible alternatives, and
5. application of investment or allocative criteria for final selection of projects.

Basic Investment Criteria

Some basic criteria are explored below as guides in decision making in educational projects:

Present Value Approach[18]

According to present value or the discounted value approach, those non-formal educational projects should receive allocation when their present value of benefits exceeds the present value of costs.[19]

The conceptual difficulty here is that most costs are incurred in the present and most benefits are received in flow through the future. Costs are relatively simple to handle--outlays plus all anticipated interest payments (discounted). "Present value" attempts to give a simple figure comparable to present cost. Imagine an asset (project) which will produce a stream of values over the next twenty years--say, to keep matters simple, $100,000 per year each year. The present value of $100,000 now is just that; the $100,000 to be earned next year is $100,000 - $7,000 = $93,000, if the rate of interest is 7 percent. The $100,000 to be earned in year 2 is presently worth $93,000 - $6,510 = $86,490, etc. Summing these values for as many years as there are involved gives the desired datum, present value. Its present value is greater than present costs; it should be clear that the investment is warranted--at least--in the sense that its benefits exceed costs, but this does not necessarily qualify *vis-a-vis* other positive return projects.

In this simple example costs (other than interest) are all considered as present and known. In educational projects, a high proportion of costs are variable and are thus incurred over time. This means that they, too, must be estimated and discounted.

Returns in the real world are not given as in our example, but must be estimated as discussed above which makes the process much more complex than a simple arithmetic example suggests. The stream of returns through time from educational investments is difficult to estimate--and that from non-formal education particularly so. We can, however, conceive of an important distinction between formal and non-formal educational projects so far as the stream of returns is concerned. *In the case of formal schooling the stream is negative during the years of schooling as a result of forgone income and tends to be positive during the period of earning. But in many situations non-formal education (e.g., learning by doing and looking) involves no marginal costs, so that the stream is positive during the years of learning.*

This can be graphically demonstrated as shown in Figure 8.

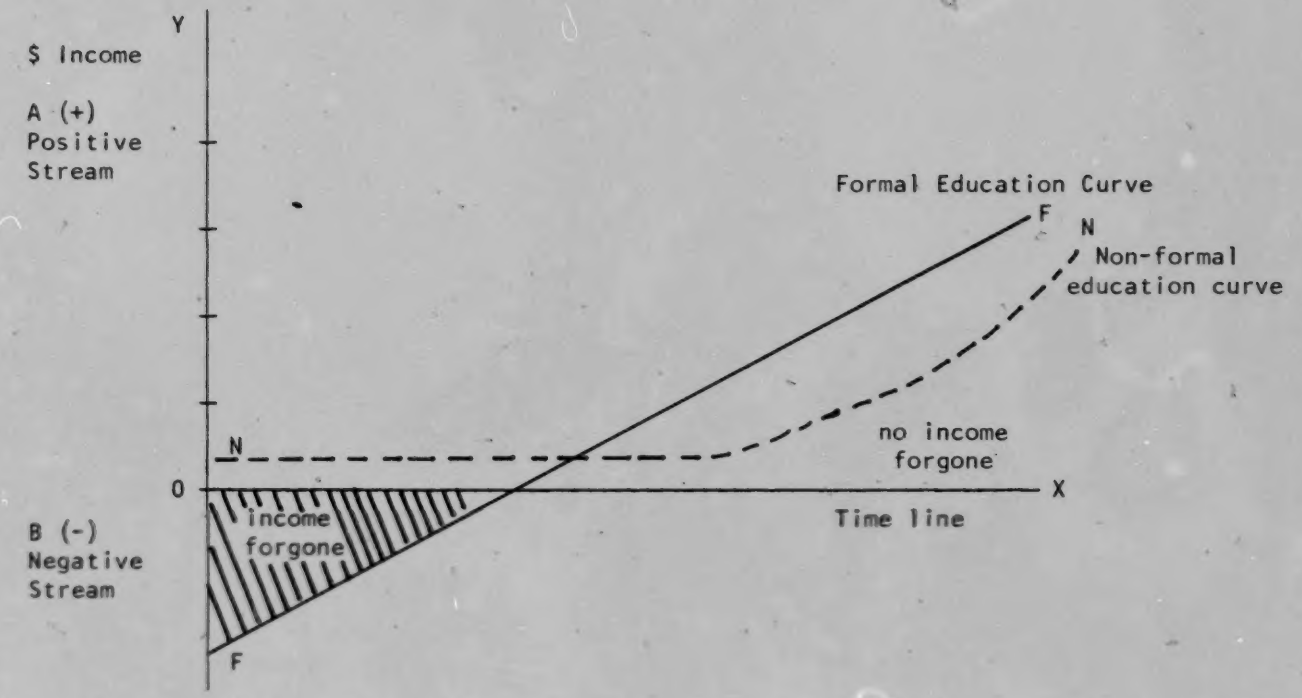

Figure 8.--Positive and negative income stream in respect to formal schooling and non-formal education.

X axis represents time (e.g., years);

Y axis represents income;

FF line shows both negative income (i.e., income forgone during the years of school attendance) and positive income;

NN line represents earning and learning together; earning is less initially, but eventually it picks up.

Benefit-Cost Ratio

The benefit-cost ratio criterion is closely associated with the present value approach. According to this approach, all non-formal projects are fundable where the ratio of the present value of benefits to the present value of costs exceeds unity.[20] Professor Hardin made a comparison of recent studies of benefit-cost analysis of occupational training programs. He reports *positive*, *zero*, and *negative* cost-benefit ratio for training classes of *short*, *medium*, and *long* duration, respectively.[21] Theoretically, there is no problem of accepting positive and zero cost-benefit ratios. Essentially this means, with positive costs in the denominator, that the benefits are zero and for a negative ratio, the nominator (benefits) is negative. Stromsdorfer[22] finds it difficult to rationalize Hardin's report of negative cost-benefit ratios for two reasons: First, a negative benefit-cost ratio implies reduction of the trainee's marginal productivity. It is possible that recurrent failure to learn a skill could seriously reduce a subject's morale and that his past skill could even deteriorate, relative to a person not undergoing training.

> *This depreciation is a result of foregoing on-the-job experience and is an opportunity cost of taking part in the retraining. The question becomes, at this point, whether to call this depreciation a positive cost or a negative benefit. Which course of action one takes is essentially arbitrary. If, for instance, all other specified benefits (negative costs) are zero and depreciation is positive and defined as a negative benefit (positive cost), then the result will be a negative cost-benefit ratio. However, if one chooses to define this depreciation as a cost (negative benefit) and, if, for instance, all other benefits (negative costs) are zero, then the cost-benefit ratio will be zero.*[23]

The question becomes essentially an empirical one as to how quickly do human skills depreciate. Another possible explanation for the negative benefit-cost ratio is that the control group is inappropriate in the sense that the utility weights a workman undergoing retraining attaches to his wage rate are different from those implicitly or explicitly assumed by the analyst. Stromsdorfer finally concludes that Hardin's negative benefit-cost ratio results from

either "a mis-specified regression model, an inappropriate control group, or both."

Internal Rate of Return

The internal rate of return is another approach of investment criteria within the framework of cost-benefit analysis. According to this approach, all non-formal education projects or programs are fundable where the internal rate of return exceeds the chosen rate of discount. In the case of on-going projects, attempts should be made to maximize the rate of return.[24]

This approach aims at calculating the internal rate of return which is that rate which equates present value of benefits and costs. This discount rate can be compared to some rate of return which is to represent the social opportunity cost of public capital. In this connection the distinction between the private and social discount rate are necessary for the purpose of effective evaluation of the public sector's investment alternatives. In a perfectly competitive capital market, there is no problem in the sense that there exists only "one interest rate for all risk-free loans for any given maturity."[25] But the imperfections of capital markets have given rise to two further concepts of interest rates: (a) the social rate of time preference and (b) the opportunity costs of public capital. The social rates have been derived from

> *. . . theoretical models of economic growth and postulated functions for the marginal utility of consumption over time. If it usually inferred from this literature that the rate of social time preference is low; that is, that the planner's interest rate should be low, giving full weight to the welfare of future generations and overriding the myopic desires of present individuals.*[26]

On the other hand, the opportunity cost for public capital is the discounted value of the flow of returns from the best use of public funds, implying that new investment projects should have yields equal to or larger than this value.

While discussing the issues involved in using an appropriate discount rate, Eckstein recommends that in cost-benefit studies the

discount rate should reflect the opportunity cost of public capital. His theoretical solution to the problem of the choice of interest rate for public investment planning is as follows:

1. *Identify the actual opportunities that are foregone and measure the flow of returns that would have been earned in the alternative use;*
2. *Apply the social rate of time preference to derive the present value of the returns foregone in the alternative use;*
3. *Undertake only those public investments which yield more present value per dollar expenditure than the foregone alternatives. This formulation, which I sketched in my book, Water Resource Development, translates into U.S. government practice as follows:*
    1. *Apply the social time preference rate of interest in the valuation of projects; but*
    2. *Compute the benefit-cost ratio of the foregone opportunities in the private or public sector. If the interest rate is very low, if we assume the social time preference to be very low, the benefit-cost ratio of the foregone opportunities will be very high.*
    3. *Undertake those public projects which have a benefit-cost ratio greater than the benefit-cost ratio of the foregone opportunities.*[27]

Despite these theoretical and practical applications, finding the chosen rate of discount for non-formal education projects presents a serious difficulty when the non-monetary consumption benefits and "spill-over" benefits of non-formal education are taken under consideration. Even in monetary terms, the chosen discount rate may not hold good over time either in a technological society or in LDCs. This problem is further complicated because of the problem involved in cost and return estimation. But given cost and return, the problem of finding the rate of discount becomes relatively easy.

Break-Even Time

In economics, we reach a break-even point at the level of output at which a firm's total revenue equals its total costs so that its economic profit is zero. Total cost, of course, includes normal profit--that is, the earnings possible for these resources in

alternative uses. We can, however, introduce the element of time in the measurement of monetary costs and benefit. Suppose we have arranged a retraining program for a group of unemployed people. When this group of trainees worked for twenty-four weeks, the trainee is expected to repay the cost of the training--another kind of break-even point for the investment made. Thus by definition, the break-even time is the time from which the accumulation of some of the net values exceeds unity (e.g., [x - y] > 1, whereas "x" represents benefits and "y" indicates costs). Put another way, we should select those non-formal education projects where the break-even time is smaller than a time "t" fixed in advance. This investment criterion enjoys official favor in the Soviet Union and in the countries of Eastern Europe.[28] Bateman[29] employed the break-even analysis for evaluating the work-experience component of the programs which seek to increase the employment and earning capacity or potential of the recipients of public assistance which are transfer payments for which no repayment or return is expected. He argues that the social and economic returns related to an individual's participation in a training program may be different. Since it is virtually impossible to estimate the factors by which these two benefits--social and individual--of the program should be adjusted, break-even analysis is applied: the ratio of the marginal or incremental costs and the estimated present or discounted values of the future earnings of additional participants in the program indicates how much increase in earnings would be necessary for the program to break even.

In brief, we have examined the four investment criteria which can be applied to non-formal education also. Turvey,[30] however, noted that the correctness of any investment criterion can be discovered only by examining its consistency with the maximand or minimand. In a command economy where the rate of growth of assets is fixed prior to implementation of the program, the internal rate of return approach is perhaps appropriate because time preference and social discount are irrelevant. But, the author favors the present value over the internal rate of return in view of the fact that the policy maker is not

generally indifferent to the relative degree of futurity of costs and benefits. Despite the fact that the present value criterion is not very appropriate for the non-marketable type of investment concerning collective consumption decisions (e.g., a non-formal education for military purposes), it is the preferred to internal rate of return for another reason, too. The comparison of the incremental or simple rate of return with any representative market interest rate may be misleading since that rate is very likely to change over time; the present value criterion does not necessarily call for the cost and discount rate. Further, the case for the present value criterion is strengthened if a budget constraint is introduced.[31] Nevertheless, controversy does exist over the most appropriate criterion to use in decision making. As might be expected, the use of different criterion yields different lists of fundable programs and rearranges the order of priority for those which appear in two or more lists. This brings us to the discussion of the problems of application.

Problem of Application of Investment Criteria

We have discussed the conceptual and methodological issues concerning cost-benefit analysis in non-formal education programs. Three types of problems emerge in the application of investment criteria in education:

(a) the general problem,

(b) the inherent problem, and

(c) the specific problem.

The General Problem

The general problem, which arises mainly because of the lack of professional agreement on certain basic issues, is essentially a problem of methodology. There is little consensus among economists on the following issues:

(a) appropriateness of the interest rate discounting long-term public investment,

(b) length of observation period,

(c) appropriateness of control group, and

(d) definition of social cost and benefits (i.e., externalities).

But there seems to be a general agreement in principle as to the desirability of some kind of objective analysis of investment in education. Despite this agreement in principle, the problem arises when a particular educational program is judged "desirable" by the present value approach and another analyst judges the same program as "undesirable" through the internal rate of return approach.

The Inherent Problem

The inherent problem arises simply because education is essentially a social product. As such, the application of a cost-benefit approach to expenditure in education raises a host of problems of serious nature. The objections to cost-benefit analysis will be analyzed under the following five headings:

(a) income,

(b) unemployment,

(c) market imperfections,

(d) uncertainty, and

(e) non-economic attributes.

Income.-- Income differentials are frequently used to measure the private benefits from educational programs--i.e., lifetime earning profiles for those with certain training are compared to profiles of those without that training. The differences in the two profiles are summed, discounted, and the result taken as the present value of the particular program to the individual or set of individuals. This seems straightforward enough but further examination suggests a number of weaknesses:

1. Income differentials may be due only to inherent differences in the individuals involved. High income may be associated with hard work; and hard workers may be those who seek and get schooling.

2. This, at best, measures private returns. Social returns may be of much greater interest and importance.

3. Estimates of income differentials depend nearly always on measurement of last performance which may have little or nothing to do with the future, particularly in a development context.

The conundrum is viewed in other terms as follows:

> *For example, a training program might be instituted to convert unskilled laborers into foremen by exposing them to skills and procedures related to leadership and supervision. A testing program might differentiate between "failures" and "successes." The "successes" then can be seen at graduation as one of the inputs with the added "increment" of exposure, practice, experience in leadership--supervisory skills and procedures. What is this increment worth? To value it on the basis of the difference in wages between foremen and unskilled workers in the plant becomes dangerously close to circular reasoning. Further, these wage differences depend on other factors such as social connections, status value, etc. There are additional problems associated with estimating the value of this increment because it cannot be dissociated from its "holder" as he utilized it through his lifetime.*[32]

There is no clear way to solve this dilemma. There is a need for adjustment of income streams for socio-economic background and ability.

> *Broadly speaking, regression analysis is used to find what differences between the average incomes of wage-earners are due to educational variables, socio-economic variables and job related variables. The first group of variables includes schooling and examination scores; the second, age, tribe, and parents' literacy and father's occupation; and the third, size and nature of the firm employing a wage earner, his job level and whether he had received on-the-job training. The effect of ability defined as innate intelligence cannot be satisfactorily assessed from the survey data, but the effect of ability as reflected in examination scores can be traced by separately analyzing data for persons with the same education and socio-economic background who achieve different scores.*[33]

Unemployment.--We have already seen that in most LDCs there exists a gap between employment and education. While formal schooling is producing some unemployment in the market, it is also creating job opportunities for some educated. Now subject to certain limitations, the use of income differentials due to additional training may be a valid measure of benefit from the viewpoint of individuals, not from the viewpoint of society. Once we make some kind of adjustment for

total employment it will drastically reduce the rate of return even from non-formal education. U.S. experience has shown that everybody is not employed immediately on having received some kind of training and retraining through various non-formal educational programs designed for manpower development.

Market imperfections.--Cost-benefit analysis assumes that wages are a valid measure of productivity. But this is not a very realistic assumption. Even if we do not take into account unemployment in estimation, imperfection in the labor market may result in differences between benefits a laborer is receiving and the contribution he is making. Public sector wages in such countries as India, Pakistan, and Bangladesh are higher than private sector wages. Union and political pressure and existence of minimum wages which reflect imperfections in the market imply distortion of minimum wages. To correct this distortion, we should estimate "shadow wages" which would prevail in a purely competitive and distortion-free labor market. But we have already seen that the calculation of "shadow" prices always is difficult.

Uncertainty.--In a dynamic and changing economy, the input-output relationship is always changing. So is the rate of return to investment in man because technical conditions are constantly changing to modify attractiveness of occupations. In the U.S., for example, many old occupations disappeared due to the impact of technology. There is no way to solve the problem other than "wise anticipation" which, incidentally, is a great deal more than mechanical projection of the future. One may argue that for formal schooling[34] this anticipation is relatively easy compared to that for non-formal education, the magnitude of which is difficult to project due to the diversified nature.

Non-economic attributes.--Education is a complex social product. It may be an *investment good*,[35] raising productivity of labor, or a

consumer good, providing personal satisfaction for both parents and children. It may be a *political good*, promoting national identity and forming an informed electorate. It may be pure *social good* in the sense of transformation of a rural society into an egalitarian society. It may be a *socio-philosophical good* to influence attitudes, norms, and values or economic behavior. There is clear economic significance to many of these facets of non-formal education. Cost-benefit analysis can, perhaps, measure the direct economic return to education investment. But quantification of the values--social, indirect, political, and other attributes--is almost impossible. Education as a total social product presumably should be the vision or view of every educational policy, but this may not always be possible because of the difficulties of measurement. Because of the extreme poverty levels in the LDCs, it may be permissible to let quantifiable economic benefits represent all values. This involves severe philosophic assumptions, but the proposition that changes in economic welfare involve changes in the general welfare in the same direction is proposed as an "unverified probability" by Pigou in his fundamental work on economic welfare.[36]

One ought not to accept this proposition without being aware of it and its implications; but failure to accept it, or something like it, leaves he who would measure virtually unemployed.

If education can be treated more as an economic service than a social service in terms of relieving the shortage of critical skill and equalizing economic opportunities among all members of the society, then the cost-benefit analysis acquires additional validity in the LDCs by virtue of its concentration on more measurable values although the set aside "other considerations" ought not to be forgotten in the process.

The Specific Problem

In addition to the difficulties explained above, there are some *specific* institutional, methodological, and conceptual hurdles in the process of application of cost-benefit analysis in many LDCs. These difficulties can be summarized as follows:

(a) Semi-educated persons in most of the LDCs migrate from rural areas to cities in search of jobs which are not readily available. The resulting "expectation gap" has created social tension and unrest; it tends to reflect the subjective rather than objective phenomenon.

(b) There is a general unawareness of program analysis in education and consequent failure to use it in decision making in many LDCs such as India, Pakistan, and Bangladesh. This is mainly because of the constraint imposed by the annual budget cycle in which financial accountability takes precedence over the efficient utilization of resources.

(c) There is a serious scarcity of analytical personnel. Most ministries of finance are run by generalists rather than specialists. Planning operations tend to be separated from budget functions, and planning operations, too, have only recently begun to undertake the sophisticated kind of analyses being described here.

(d) The lack of data and attempts to accumulate appropriate data is always a problem of measurement of the social benefit of outputs and social cost of input.

(e) Often education is seen as political good by politicians rather than an economic good. No distinction is made between "education as an investment" and "education for the consumers."

So far we have talked about cost-benefit analysis and its problem of application in non-formal education. The whole analysis is centered around the question of efficient allocation of scarce resources. But we must also say something about *efficient management* of allocated resources in non-formal education. This is sometimes referred to as cost-effectiveness analysis.

Cost-Effective Analysis and Non-Formal Education

This analysis starts by defining program objectives as clearly as possible and calls for some measure of effectiveness or utility which is related to the objective in question. This implies a search for alternative ways of meeting the defined objectives. This process is likely to yield a range of possibilities for examination of any non-formal educational program as to costs and gains. Thus it calls for documentation of both quantitative and qualitative data. The

information that needs to be brought together on costs and effectiveness occurs on three levels:[37]

1. Cost and effectiveness in a given current period for each level of the program.
2. Future cost and effectiveness implications of present programs and alternatives for each level of the program.
3. Changes in cost and effectiveness that accompany changes level of volume or quality of services provided both current and future periods.

This systematic search for alternatives aims at finding out the *least costly alternative* or the alternative giving the highest effectiveness subject to budget constraints.

Other than the familiar problems of output quantification, the difficulty with regard to these analyses arises mainly because of the fact that most of the programs have multiple objectives. It is really difficult to make cost effective analysis in the case of such projects. This is one of the reasons why manpower training programs through non-formal education in the U.S., for instance, have evaluative problems.

All these difficulties are intensified as the time horizon for planning is lengthened. Identifying "preferred alternatives" demands more parameters and more data--even less readily available than those already discussed. Thus, in order to reduce uncertainty, sensitivity analysis and contingency planning techniques may be adopted for long-range planning. Sensitivity analysis seeks to measure the dependency of the value of a variable to alternative values of a particular parameter. Sometimes the sensitivity analysis is carried out prior to the final data collection only to determine the degree of effort to be required for the determination of concerned parameter.

Contingency planning requires additional flexibility and adaptability seeking to provide for various alternative routes when and if various hypothesized events and changes occur.

Conclusion

In spite of these difficulties, cost-benefit analysis is useful as a guide to investment in education for two reasons: (1) it may restrain the abuse of economic arguments in the political process,

and (2) it may provide a stimulus to research and scientific understanding of the problem of investment in education.[38] If nothing else, it identifies the pertinent questions.

The "intangibles" plague us; new techniques for making them tangible or for letting them be meaningfully represented by other data are required if complete, solid answers are to be found either to the allocative or efficiency questions. We can now get solid responses to perhaps 15 percent of the questions; another, say, 40 percent is subject to "unverified" but solid speculation; the remaining perhaps 45 percent in areas in which we cannot even speculate sensibly. The task is to increase the solidity of the speculation in the second area and to make the third area smaller.

Decisions *have* to be made--both with respect to the allocation of resources and their use. In the absence of objective measures to assist decision makers, decisions must be made on the basis of intuition, patronage, politics, guess, precedent, and so on. The problems of attaining increasing objectivity are evidently formidable.

NOTES: CHAPTER III

1. T. W. Schultz, *Investment in Human Capital* (New York: The Free Press, 1971), pp. 48-62.

2. R. A. Wykstra, ed., *Education and the Economics of Human Capital* (New York: The Free Press, 1971), p. 3.

3. F. H. Harbison, *op. cit.*, p. 11; see also W. G. Bowen, "Assessing the Economic Contribution of Education, and Appraisal of Alternative Approaches," in *Three Essays* (Princeton, N.J.: 1964).

4. T. W. Schultz, "Investment in Human Capital," *American Economic Review*, Vol. 51 (1961), pp. 1-17.

5. John M. Hunter, *Economic Aspects of Higher Education in Brazil*, Monograph No. 5, Latin American Studies Center, Michigan State University, East Lansing, Michigan 48823, 1971, p. 17.

6. *Ibid.*, p. 19.

7. The classical economists, such as Adam Smith, Ricardo, Mill, and Bentham, are those who in the period 1750-1850 first formulated a systematic body of economic principles.

8. The Austrian school flourished during the later years of the 19th century. The concept of marginal utility--a very important concept in economics--had its origin in Austria. Writers such as Karl Menger, Jevons of England, Walras of France, helped develop this concept and are generally regarded as being of the Austrian school.

9. R. D. Khatkhate, "Opportunity Cost and Its Application to Underemployment," *Social Research*, Vol. 28, No. 1 (1961), pp. 60-70.

10. Ernest W. Stromsdorfer, "Occupational Training Programs and Manpower Programs for the Disadvantaged: Discussion," *Cost-Benefit Analysis of Manpower Policies*, proceedings of a North American Conference, May 14-15, 1969, ed. by G. G. Somers and W. D. Wood under the auspices of the Center for Studies in Vocational and Technical Education, the University of Wisconsin, and Industrial Relations Centre, Queen's University.

11. *Ibid.*, pp. 153-54.

12. Jack Wiseman, "Cost-Benefit Analysis in Education," *Southern Economic Journal*, July, 1965, pp. 1-14. Also reprinted in R. A. Wykstra, ed., *Human Capital Formation and Manpower Development* (New York: The Free Press; London: Collier-Macmillan Limited, 1971), p. 185.

13. There are often several ways of combining resources to achieve a given output, but only one way results in the lower cost. The cost function describes the minimum costs of producing various rate of output derived from production and factor: supply functions. Let the cost function be $C = F + v(Q)$; where F = total fixed cost, $v(Q)$ = total variable cost associated with each level of output. Thus, the average fixed cost associated with each level of output. Thus, the average fixed cost is F/Q and its slope = $-F/Q^2$. Average variable cost is $\frac{V(Q)}{Q}$ and its slope is:

$$\frac{VQ'(Q) - V(Q)}{Q^2} = \frac{1}{Q}\left[v(Q) - \frac{v(Q)}{Q}\right]$$

14. Richard Judy, in *Cost-Benefit Analysis of Manpower Policies*, proceedings of North American Conference, May 14-15, 1969, ed. by G. G. Somers and W. D. Woods, Industrial Relations Center, Queens University, Canada, p. 24.

15. J. R. Buchanan and W. C. Stubblebine, "Externality," *Economica*, Vol. 29, No. 166 (November, 1962), pp. 371-84.

16. Roland N. McKean, "The Use of Shadow Prices," *Problems in Public Expenditure Analysis*, ed. by S. B. Chase, Jr. (Washington, D.C.: The Brookings Institution, 1968), pp. 33-77.

17. Burton A. Weisbrod, "Benefits or Manpower Programs Theoretical and Methodological Issues," in *Cost-Benefit Analysis of Manpower Policies*, ed. by G. G. Somers and W. D. Woods, Industrial Relations Center, Queens University, Canada, pp. 14-15.

18. Algebraically, the formula for determining the present value (v) is as follows:

$$v = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)} + \ldots \frac{R_n}{(1+i)^n}$$

where R = expected return,
i = interest rate, and
n = time period when no return is expected.

19. We may write the rule as follows:

$$\frac{x_1}{(1+i)} + \frac{x_2}{(1+i)^2} + \ldots \frac{x_n+s}{(1+i)} > \frac{y_1}{(1+i)} + \frac{y_2}{(1+i)^2} + \frac{y_n}{(1+i)^n}$$

where x_1, x_2 . . . and y_1, y_2 are series of benefits and costs in successive years, respectively, and

i = interest rate,
s = scrap value in terms of physical facilities, if any.

If we know R and i, we can deduce V; similarly, if knowing V and R, we can find out i. Of the four variables V, R, I, and n, V and i are unknown. The determination of i is always a problem.

20. Although it is difficult to quantify the subjective element of costs and benefits arising out of any non-formal educational program, we may write the rule algebraically as follows:

$$\frac{\frac{x_1}{(1+i)} + \frac{x_2}{(1+i)^2} + \ldots \frac{x_3+s}{(1+i)^3}}{\frac{y_1}{(1+i)} + \frac{y_2}{(1+i)^2} + \ldots \frac{y_3}{(1+i)^3}} > 1$$

where x_1, x_2 . . . x_3 and y_1, y_2 . . . y_3 are series of benefits and costs in successive years respectively, and

i = interest rate,
s = scrap value in terms of physical facilities, if any.

21. Einar Hardin, "Benefit-Cost Analyses of Occupational Training Programs: A comparison of Studies," *Cost-Benefit Analysis of Manpower Policies*, proceedings of a North American Conference, May 14-15, 1969, ed. by G. G. Somers and W. D. Wood. Published jointly by the Industrial Relations Center, Queens University, Kingston, Ontario, and the Center for Studies in Vocational and Technical Education, the University of Wisconsin, Madison, Wisconsin, 1969, pp. 97-118.

22. Stromsdorfer, *op. cit.*, p. 157.

23. *Ibid.*, p. 158.

24. That is,

$$\frac{x_1-y_1}{(1+r)} + \frac{x_2-y_2}{(1+r)^2} \cdot \cdot \cdot \cdot \frac{x_n-y_n}{(1+r)^n} = 0 = \sum_{n-1}^{n} \frac{x_n-y_n}{(1+r)^n} = 0$$

where r = internal rate of return,
x = earnings before or after tax;
y = cost of education,
n = time, age, etc.

25. Otto Eckstein, "Interest Rate Policy for the Evaluation of Federal Programs," in *Human Capital Formation and Manpower Development*, ed. by R. A. Wykstra (New York: The Free Press, 1971), p. 151.

26. *Ibid.*, p. 152.

27. *Ibid.*, p. 153.

28. U. E. Malinvand, "Interest Rate in the Allocation of Resources," *The Theory of Interest*, ed. by F. H. Kahn (London: Macmillan and Company, 1965).

29. Worth Bateman, "An Application of Cost-Benefit Analysis to the Work Experience Program," *American Economic Review*, Vol. 57, No. 2 (May, 1967), pp. 80-90.

30. Ralph Turvey, "Present Value-Versus-Internal Rate of Return--an Essay in the Theory of Third Best," *Economic Journal*, Vol. 73, No. 289 (March, 1963), pp. 93-98.

31. M. S. Feldstein and J. S. Flemming, "The Problem of Time-Stream Evaluation: Present Value-Versus-Internal Rate of Return Rules," *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 26, No. 1 (February, 1964), pp. 79-85.

32. Unpublished paper on "Program Evaluation in Education" by John M. Hunter, Department of Economics, Michigan State University, East Lansing, Michigan 48823.

33. World Bank, *Cost Benefit Analysis in Education: A Case Study of Kenya*, Occasional papers number 14, 1972, pp. 3-4.

34. The supply of labor can be projected by using time series extrapolations for primary and secondary school leavers, with some assumptions about growth of enrollment in different levels of schooling. Demand for labor is also projected as a function of wage and GDP (Gross Domestic Product), but elasticities can only be approximated rather than estimated.

35. "Good" in the broad sense of product to include "services."

36. A. C. Pigou, *The Economics of Welfare* (New York: Macmillan and Company, 1932; 4th edition), p. 20.

37. *Planning for Educational Development in a Planning, Programming, Budgeting System* (Washington, D.C.: George Washington University 20036, 1968), p. 27.

38. S. W. Circiacy-Wantrup, "Benefit-Cost Analysis and Public Resource Development," *Journal of Farm Economics*, Vol. 37, No. 4 (November, 1955), pp. 677-89.

CHAPTER IV

APPLICATION OF INVESTMENT CRITERIA AND NON-FORMAL EDUCATION

We have already indicated that one may acquire job oriented skills either in the schools or on the job. Through the application of investment criteria coupled with wise guessing, the decision maker has to choose the most efficient line of approach so far as the investment in human capital is concerned. Investment in labor training may be treated as a kind of human capital formation which tends to raise the productivity of the workers and their future earnings. The same type of labor training can occur within the structure of formal schooling. The choice of the training institution is not entirely the worker's, even after he enters the labor market. Both the firms and government play a role depending on whether the economic system is traditional, market, or command based.

Return on Investment

Because of the scarcity of resources, the rate of return from expenditures on non-formal education is critical. In making educational investment decisions, forgone benefits must be taken into account when determining which will give the highest payoff: formal or non-formal educational programs. We have already discussed this issue in the preceding chapter. However, on the question of return on investment in education, the principal approaches as indicated by Harbison and Myers include the following:

> *(1) determination of the relationship between expenditures on education and growth in income or in physical capital formation over a period of time in one country, (2) the residual approach in determining the contribution of education to gross national product (GNP), (3) calculation of the rate of return from expenditures on education and (4) making inter country correlations of school enrollment ratios and GNP.*[1]

Each of these approaches has been explained with particular reference to the U.S. In the following paragraphs, we propose to discuss these approaches, although little is available dealing with the rate of return from expenditures on non-formal education.

As for the first approach, Schultz attempted to establish a relationship between expenditure on education and income or physical capital formation for the period 1900 and 1956. He noted that the national income of the U.S. has exceeded the combined contribution of the three factors on production: land, labor, and stock of reproducible capital. He suggested that this discrepancy can be explained partly by the benefits arising out of economies of scale but largely by the improvement in the quality of labor (e.g., education).

> *Examining the investment made in human beings in the United States, Schultz found that the stock of education in the labor force rose 8 1/2 times between 1900 and 1956, while the stock of reproducible capital rose only 4 1/2 times. He concluded that between 36 and 70 percent of the hitherto unexplained rise in the earnings of labor was explained by returns to the additional education of the workers.*[2]

A principal difficulty for our purposes is that in such calculations no attempt has been made to show the contribution of formal and non-formal education separately. Parenthetically, factors other than education, particularly public health, contribute significantly to the quality of labor.

> *A more recent attempt to measure the costs of all types of education in the United States included estimates for "education in the home" (earnings foregone by mothers staying at home to educate their preschool children), "training on-the-job," "education in the church," "education in the armed services," as well as costs of formal education, special schools, other Federal expenditures, and costs of public libraries. The total cost for 1956-1957 was computed at over $60 billion, or 12.9 percent of adjusted gross national product. The comparable figures for 1955-1956 were over $51 billion and 11.8 percent of GNP.*[3]

With respect to the *second approach*, several economists including Solow and Denison[4] attempt to measure the contribution of education by deducting the contribution attributed to measurable inputs of capital and labor. The main problem of this residual approach is that the

portion finally attributed to education is hardly specific, to say nothing of its identifying the contribution of non-formal education. But in the absence of a measurement in which one can have confidence through the return to investment in non-formal education, this approach may serve as a useful, if crude, guide to the policy maker.

With regard to the *third approach*, attempts have been made by several economists including Mincer, Becker, and Hector Correa to compute the internal rate of return at which incremental "income obtained later in life would just compensate for the direct expenditure on education and the value of income foregone during the period of schooling"[5] or non-formal educational training. If this rate of return is higher than the prevailing interest rate on alternative investments, then the investment in education is a desirable or profitable one. Several different studies[6] indicate that the internal rate of return for primary education is higher (e.g., 20 percent or higher in the U.S. compared to 10 to 15 percent in secondary education) because costs involved are relatively lower and little income is forgone.

There are no known data on this question with respect to less developed countries. We may speculate, however, that the difference in rates of return to primary and secondary education is probably smaller since youngsters enter the labor market earlier and income forgone becomes an element to consider at an earlier age. Careful empirical attention should be given to the private and social returns related to becoming "functionally literate" since this is a critical educational policy issue for less developed countries which is hardly an issue at all for countries such as the U.S.

The differential rate has an interesting implication for non-formal education since many resources are wasted at the primary level in the LDCs. Despite its popularity, the primary education may not be the most efficient form of education for a poor country seeking economic development. For example, out of about 30 million children enrolled each year in grade one of Asian schools, over 50 percent either repeat the grade or drop out of school and into ultimate

illiteracy. This is an expensive introduction to education (estimated at $100 million a year in Asia) for the little it accomplishes, to say nothing of the human potential forever forgone.[7]

Finally, Harbison and Myers make an extensive attempt to correlate educational and economic indices. For 75 countries they develop a composite index to distinguish among countries in terms of four levels of human resource development; for example, Level I, underdeveloped; Level II, partially developed; Level III, semi-advanced; Level IV, advanced. In all, 14 different indicators (e.g., GNP per capita, teachers, scientists, engineers, physicians per 1,000 population; first and second level school enrollment ratio; public expenditure on education as percent of national income) were tabulated. Analysis of their data led them to conclude that economic development correlated more strongly with higher education than with primary education or literacy. From this they developed a composite index of human resource development. This index consists of the percentage of the age group in secondary school plus the percentage in higher education multiplied by a weight of 5. The correlation between this composite index and gross national product per capita in the U.S. is very high (0.888) but great care must be taken to avoid assigning otherwise unverified causal relationships on the basis of such a coefficient.[8]

In path breaking studies, however, Mincer and Becker studied rates of return on investment in on-the-job training which is only a segment of non-formal education. Mincer assumes that the rate of return from on-the-job training is almost equal to that from formal schooling. The cases of male/female and white/nonwhite wage differentials are analyzed through the "investment hypothesis" which suggests that human capital is a significant factor in explaining wage differentials and employment patterns. Becker also considers the matter because it illustrates the effect of human capital on earnings, employment, and other economic variables. He argues: if the present values of net earnings in different occupations are presumed to be the same as one would expect in a perfect model, market costs

and the internal rate of return can be measured from the net earnings information. Becker and Mincer do, however, provide an innovation in human capital theory by linking to the time profile of investment in human capital.

In this connection, Blaug makes the following comment:

> *In using age earning profiles to calculate rates of return on investment in schooling, are we not in fact confusing the effects of schooling with the effects of training? Indeed, if all labor training is general training, the age earning profiles we observe systematically understate earnings attributable to formal education in the early years of employment and overstate them in the later years; likewise, even if training is specific, there is a general tendency to overstate earnings attributable to schooling.*[9]

However, using age-earning profiles, Mincer calculated the total amount invested in on-the-job and off-the-job training in the U.S. in 1939, 1949, and 1958. His calculation is based not on the accounting data at the enterprise level but on the net return streams by three levels of education and calculation of corresponding private rates of return on investment in schooling. "He then applied these rates to each successive profile to determine what earnings would have been if individuals had not invested in training. These forgone earnings constitute the costs of general training and hence measure the investments individuals make in training."[10] The forgone earnings as a result of general training can be graphically illustrated as shown in Figure 9. It is assumed that persons who are receiving general training tend to earn more than the persons who are receiving specific training. But the way we have drawn the specific and general training line shows uncertainty. It is conceivable that despite certain advantages, persons with general training may not compete with persons with specific training in a technological society such as the U.S. because specific training tends to increase the probability of creativity or innovation in the same or in alternative lines of production.

Mincer, however, is aware of the drawbacks of his analysis and assumptions such as that of a constant rate of return to investment. He further acknowledges his failure to adjust for differences

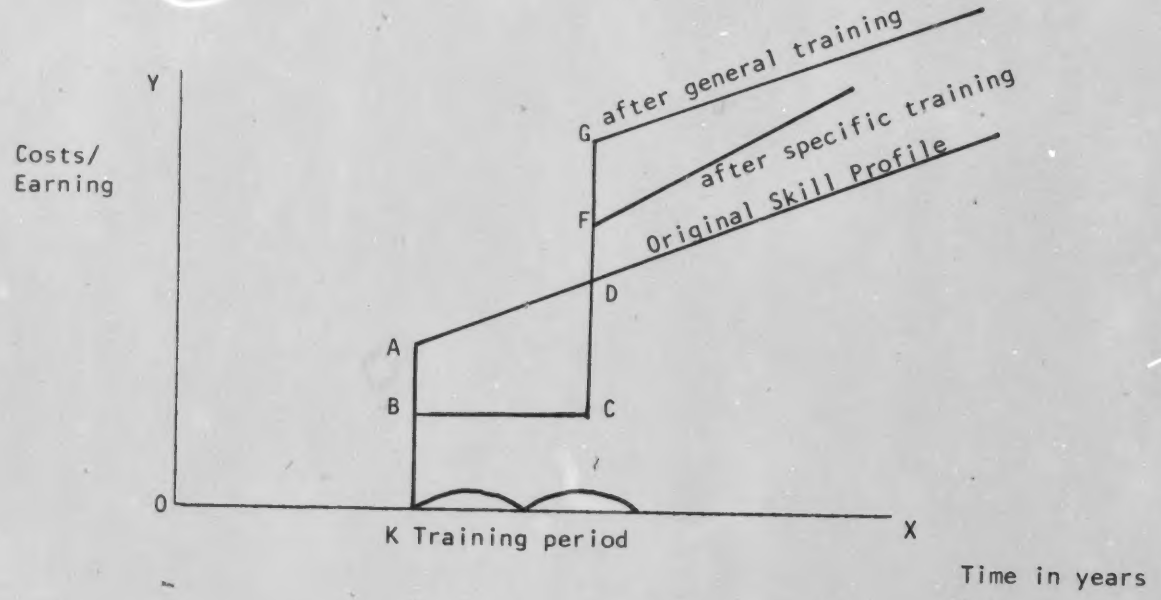

Figure 9.--General and specific training.

X axis represents time;

Y axis represents cost and earnings;

ABCD = income forgone as the result of general training;

KBAD indicates that no loss of earning as a result of specific training because of original skill profile line and after specific skill line are the same;

DF indicates raise in pay after specific training;

DG indicates raise in pay after general training.

in native ability and home background and to provide reliable evidence on the costs of specific training. However, Blaug makes the following comments on Mincer's studies.

> *But more important than any of these is the assumption that rates of return on schooling are not very different from those on training. He does not make an effort to check his results by examining data on the costs and returns of particular training programs in the United States. For example, comparisons of craft apprentices' and operatives' earnings gave an average private rate of return to apprentice training for three industries well below the private rate of return on college education, although social rates of return were not very different in the two cases (Mincer, 1962, pp. 533 to 534). However, from the point of view of Mincer's calculations, it is the private rate of return that is important, since the private rate of return on schooling seems to exceed the rate of training, the implication is that his estimates of the costs of training are actually on the low side. Likewise, it follows that calculations of the rates of return on schooling from observed age earnings profiles are, in fact, biased downwards; if we could truly separate the costs and returns from training, rates of return would rise, a surprising result.*[11]

Ben-Porath[12] also develops a model which generates some of the qualitative characteristics of the observed life cycle of earnings: zero earnings followed by a period of increasing earnings at diminishing rate with an eventual decline.

The production function is intended to give some of the characteristics of the technology influencing the individual's decision to invest in himself. Production functions describe relationships between outputs of commodities produced by firms and the various combinations of the inputs they employ in the production. Knowledge of these production functions for the individual is equivalent to knowledge of potential demands by industry for skills. Such knowledge should be critical to the individual in deciding on the amount and nature of investment in his own skill development. In this connection, Simmons comments:

> *Rate of return models usually estimate lifetime earnings as a function of age and schooling, and show a high rate of return to all levels of education in a developing country, with primary consistently the highest of the three levels. How correctly is this model specified? Omitting variables like*

> *socioeconomic status, quality of schooling, work experience, personality and health, to suggest a few, should upwardly bias the coefficients of the traditional model. Using survey data from the Tunisian shoe industry to estimate earnings regressions, I found that work experience was much more significant than either using cognitive skills on the job or primary schooling in predicting earnings.*[13]

From the preceding analysis it is clear that we have not yet explored fully the costs, benefits, and incidence of the non-formal educational training. Some attempts have, however, been made to make cost-benefit analysis of the government training and retraining programs and schemes (e.g., Borus,[14] Oatley,[15] Lester,[16] Gordon,[17] Weisbrod,[18] Hardin,[19] and others).

Since education, formal or non-formal, is a complex social product, the measurement of the rate of return is highly complex. Unlike dams or steel mills it is not possible to calculate the rate of financial return on a non-formal educational project because of the difficulty of determining how much is really consumption, how much represents investment, and how much is a political good. The goals of modern societies are political, social, cultural, and economic. And the purposes of the non-formal education are likewise complex and may be different in different societies depending on priorities. If we elect to give top priority to economic growth, then the program of human resource development through non-formal education must be designed to provide the knowledge and critical skill required by the economy. The better the definition of a program and the greater the degree to which output is quantifiable, the better is the chance for ascertaining the rate of return from investment in non-formal educational programs. The fact is that the measurement of rates of return on non-formal educational investment have both individual and social dimensions. The individual dimension arises from the fact of net loss or gain of individual earnings from the acquired skill and knowledge. The social dimension arises from the external economies or diseconomies from an investment in non-formal educational programs and from the fact of imperfect markets.

> *Through pricing policy and various forms of financial aid, society has "hidden" many of the costs so that the individual will be more likely to make a favorable decision about continuing his education then he would make in a completely free market unsubsidized situation. From society's point of view, if there are significant communal benefits resulting from an educational program it is rational not to depend on individual rational full cost decision.*[20]

Furthermore, it is a mistake to think of returns from non-formal educational investment in economic terms only. The efforts to give greater emphasis to human resources in economic analysis and the attempts to measure the contribution of education to economic growth are highly desirable; the notion that non-formal educational programs either can or should be analyzed solely in economic terms is unrealistic. Thus, the return on education in terms of increases in individual or national income, increases in productivity, cannot be taken as the only test of the effectiveness of non-formal educational programs. Nevertheless, economists do define and measure progress by economic criteria, even if as individual members of the society they have often a much broader view of the goals of a society.[21]

Conclusion

There is an increasing awareness among economists of the role of non-formal education in human resource development. But only a part of the investment in non-formal education (e.g., on-the-job training) is explored at all, and even there the surface has just been scratched. Investment in in-service training or follow-up training where non-formal education can be a complement to formal education has yet to be explored.

Further, there is little empirical information on the rate of return to non-formal education although several attempts have been made to calculate the rate of return from formal schooling in the U.S. Education is a complex social good; it is difficult to measure its rate of return in economic and financial terms as we would a factory or service where the costs tend to be unambiguous and the outcome is measured in unambiguous *profits*.

NOTES: CHAPTER IV

1. F. Harbison and Myers, *Education, Manpower and Economic Growth* (New York: McGraw Hill, 1964), p. 5.

2. O. Popenoe, "Education as Investment," in *Development Digest*, ed. by P. W. Blair, for USAID, Vol. VI, No. 1 (January, 1968).

3. Harbison and Myers, *op. cit.*, p. 6.

4. *Ibid.*, pp. 5-8.

5. Popenoe, *op. cit.*

6. UNESCO Bulletin, Bangkok, Vol. 1, No. 2 (March, 1967), p. 68, for Education in Asia.

7. *Ibid.*

8. In *Development Digest*, Vol. VI, No. 1 (January, 1968), p. 1.

9. M. Blaug, *op. cit.*, p. 195.

10. *Ibid.*, p. 196.

11. *Ibid.*, p. 199.

12. Yoram Ben-Porath, "The Production of Human Capital and the Life Cycle of Earnings," *Journal of Political Economy*, Vol. 75, No. 4 (August, 1967), pp. 352-65.

13. John Simmons, "The Income Benefits from Formal and Informal Education: Estimates for a Socioeconomic Model," *Economic Development Reports*, No. 211 (Cambridge, Mass.: The Center for International Affairs, Harvard University, April, 1972).

14. E. Michael Borus, "A Benefit Cost Analysis of the Economic Effectiveness of Retraining the Unemployed," *Yale Economic Essays*, Vol. 4, No. 2 (Fall, 1964), pp. 371-427.

15. M. Oatey, "The Economics of Training with Notes on the Industrial Training Act," *British Journal of Industrial Relations*, March, 1970.

16. R. A. Lester, *Manpower Planning in a Free Society* (Princeton, N.J.: Princeton University Press, 1966).

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18. B. A. Weisbrod, "Conceptual Issues in Evaluating Training Programs," in *Monthly Labor Review*, October, 1966.

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CHAPTER V

PLANNING, GROWTH, DEVELOPMENT, AND NON-FORMAL EDUCATION

Introduction

Planning is a complex phenomenon. Modern development planning, as practiced in the LDCs since World War II, has used a model similar to that developed in the U.S.S.R. after World War I.[1]

Despite the great diversity of forms,[2] all planning seems to be concerned in some way or another with "figuring out how you get from here to there; and from where you are to where you want to be." Put it another way, it is an organized conscious attempt to exploit the available resources to achieve specific goals through a rational application of sets of choices among various possible alternatives.

> *Planning as a process is an indispensable pre-condition for the formulation of effective development policies and measures. A plan can play an important part in the planning policies and measures. But, if a plan is prepared before the process has begun in earnest or if it is unable to generate the process, it is likely to have little significance for development.*[3]

Development planning may include sub-national planning for one region or multi-national regional planning involving a series of regions covering an entire country. Experience shows that it is not only the economic potential but also the political will coupled with administrative capacity that determines whether or not a plan will be a success or a failure.[4] The political will can be quantified in terms of taxes, credit, and investment. While it is important to know the theory of planning, the importance of empirical evidence and experience in planning in other countries should not be overlooked. Rather, a priority should be given to the lessons from experience of planning. Colm and others expressed a similar view in preparing a plan.[5]

With this brief introduction of development planning, we turn to the question of evolution of non-formal educational planning.

Evolution of Non-Formal Educational Planning

Although we are just developing the non-formal educational planning concept, an early integrated and systematic attempt on a national scale was made at developmental planning during the first Five-Year Plan of the U.S.S.R. Despite the Soviet success, there was not ready acceptance of the concept of educational planning in the Western countries and the non-Communist LDCs. Gradually, the importance of planning in the field of social policy was stressed by non-Marxist economists such as Mannheim and Tugwell. Thus, several fragmented experiments in educational planning were made in the form of the Tardieu plan of 1929 and the Marguet plan in 1934 in France, and the New Deal planning in the 1930s in the U.S. But only after the second World War, the Western countries and many non-Western LDCs saw social ferment in the form of rising expectations of the masses, coupled with demand for education. The concept of educational planning gained currency in many Western countries such as France where "education became an integral part of the national plan in 1953."[6] In the U.S., where education is a state and local function, the lack of a federal plan does not, of course, imply lack of planning. Education became an important sector of the development plan of many LDCs. Thus, education figures prominently in the development plans of countries such as India in 1951, Burma in 1952, Colombia in 1957, Pakistan and Morocco in 1958, Tunisia in 1959, Bangladesh in 1972, and so on.[7]

The preceding discussion indicates that the educational planning concept is considered to be a part of the broader concept of national economic planning for the purpose of the development of social infrastructure. Central to the concept is the underlying assumption that formulation and implementation of any educational plan require investment just like other sectors of the economy, e.g., agriculture and public health. But the measurement of return from such investment presents a serious problem.[8] We have already discussed the problems involved in cost and benefit estimation. A UNESCO report covers many aspects of educational planning.[9]

However, the interest in non-formal education is of recent origin. In addition to Michigan State University's involvement in conducting a program of studies in non-formal education, the World Bank has been carrying case studies of non-formal education in thirteen LDCs.[10] Besides, several other U.S. universities such as the University of California at Los Angeles, and the University of Pittsburgh are also involved in non-formal educational research. General awareness about non-formal education is also indicated by the fact that several U.S. universities such as Stanford and Michigan State University are offering courses and seminars on non-formal education. USAID has provided financial aid for many non-formal educational programs such as the M.S.U. project through financial support.

Concept of Non-Formal Educational Planning

The non-formal educational planning is a conscious and deliberate policy package to exploit the available resources in the most efficient way--to achieve certain socio-economic goals or objectives. This definition has five distinct parts:

(a) a clear statement of objectives;

(b) a survey of resources;

(c) matching resources and objectives through technical coefficients;

(d) implementation of the plan;

(e) evaluation and review.

Since planning for the non-formal education sub-sector should be a continuous process, the process entails the above-mentioned order of succession of interdependent actions like any other sector planning. Elaboration of these interdependent actions may be useful.

(a) A clear statement of objectives: Only through a clear statement of objectives of any non-formal educational program(s) is it possible to reflect the societal need. This "need" has diverse dimensions encompassing social, economic, cultural and aesthetic and other values; and this is likely to require determining the order of priority among various objectives, some of which may come in conflict with others.

(b) A survey of resources: A survey of educational needs is essential in order to chart a rational course towards its objectives. It is imperative that the non-formal educational program be drawn in the light of present conditions and recent trends. This involves the assessment of alternatives which require the assessment not only of human and financial resources, but also of political, sociological, and administrative capacity or constraints. Any planner who does not give proper weight to the whole range of constraints is likely to meet with failure in the process of implementation. Many development plans (education as a part of them) have met with failure, not because of the lack of financial and economic resources but because of the lack of political will.[11] Success of a plan for non-formal education requires the involvement of the leaders of the community or political leaders. Administrative effectiveness to carry out the program at its implementation stage is similarly frequently assumed to exist without careful consideration. Furthering the program requires proper understanding and acceptance by the people or community concerned.

> *The greatest difficulties met by planning are socio-psychological resistance, inertia, lack of enthusiasm. There is, therefore, a developing feeling that educational planning cannot be effective if teachers, students, and the community at large are not always better informed and consulted. Efficient planning nowadays is an essentially democratic process.*[12]

In choosing the best alternative, the overriding concern for the educational economists is to maximize the benefits from the use of scarce resources. The fact of scarcity is the heart of economic problems.

> *Educational economists have, in the way of all economists, a relatively exact point of view. He endeavors to make the best possible use of scanty resources, whether financial or human. The outlook of the philosophers, or educationalists--if they found their inclinations--is, of course, diametrically opposed. They consider, and rightly too, that education, intellectual training, moral instruction, are the rights of every human being. This belief consequently leads to a non-instrumental outlook on the educational process. At the other end of the scale, the economist, by the very nature of his profession, must cultivate an instrumental outlook.*[13]

Evidently there is a need for reconciling these opposing views. Subject to economic, social, and political constraints, a mechanism of incentives needs to be developed so that educational effort can be directed towards a desired channel.

(c) Matching of resources and objectives: This is a very important step in the planning process and is done through the coefficient of relative effectiveness. This means comparing rates of return or pay-offs on alternative investments. These are influenced by such factors as the demand for educational products, costs involved in providing services, availability of capital, and the level of technology. Earlier discussion has indicated that it is no easy task to match resources with objectives. The difficulty arises partly from the problem of setting up an efficient order of priorities. This arises because of the complex nature of the educational output.

(d) Implementation of the plan: Without a clear strategy for implementation, a plan is meaningless since in itself no action is produced. Many development plans in which an educational plan is a part have not produced the desired result simply because the planners failed to make an "adequate provision for their implementation";[14] it is easy to say much about what is to be achieved, but difficulty arises in the means of attaining the objectives.

(e) Evaluation and review: Since a plan is always future oriented, its course is hardly possible to predict--hence the need for constant review and adjustment and readjustment in the light of change in the social dynamics. In this perspective, non-formal educational planning must be a continuous process, with decisions subject to constant review. We have just outlined in its broad detail the various "stages" of the non-formal educational planning in its logical sequence. Since birth, growth, maturity, and decay of non-formal educational programs can go on simultaneously, all the "stages" of planning are very likely to go together. Any particular program in non-formal education can contribute in the overall sector planning process involving execution of a rational system of choices based on consideration of viable alternative investments compiled with economic

and social benefits and costs. If a program in the area of non-formal education does not generate the process, it may have relatively little significance for development and change compared to one which is reinforcing the process of change.

Two Levels, Two Forms, Two Approaches

So far we have discussed the concept of non-formal educational planning and the process it entails. Educational economists can conceive of *two* levels, *two* forms, and *two* approaches of non-formal education.

As for levels, we have already indicated that planners can deal with non-formal educational planning either at *macro-level* which involves the study of the complete, integrated system of non-formal education or a part thereof within the overall framework of development planning, or at *micro-level* involving an analysis of individual programs or institutions. In this present study we are mainly interested in macro-studies of non-formal educational planning.

As for forms, it may be planning *by direction* involving the direct intervention by the government when the greater part of the non-formal educational activities are in state hands. It may be planning *by inducement* involving marginal intervention by the government to correct certain imbalances when the greater part of the economy and, for that matter, a greater part of non-formal educational planning still remains in private hands. Such planning has to be formulated through a process of successive approximation by means of a comparison of resources available and of claims upon these resources. In such cases it may be necessary to adjust the scale and composition of the non-formal educational programs to the limited supply of certain specific resources such as foreign exchange, administrative and technical capabilities.

As for approaches, it may be planning of non-formal education as a *sub-sector* of overall educational planning, or we may go ahead with planning of non-formal education as an *independent sector*, keeping in view both economic and social goals.

As argued below, I favor planning of the non-formal educational sector in its own right. Treated as a sub-sector of overall economic planning, it becomes merely an extension of manpower planning, thereby losing important control over its potentialities for social change. On the other hand, it might be possible to realize two objectives--manpower planning in the narrow sense and that of influencing social change.

For the purpose of our analysis we have divided the economic system into three broad areas:

(a) production areas (e.g., agriculture, business, etc.);

(b) physical infrastructure (e.g., water, power, communication, etc.);

(c) social infrastructure (e.g., health, labor, education, etc.).

Every area of the economic system needs trained and skilled manpower. For example, agriculture needs extension agents, industry and business need stenographers and accountants.

The models shown in Figure 10 will illustrate these two approaches. We can have a situation as in Model I if we treat planning of the non-formal educational sector as a sub-sector which is subservient to other sectors of general economic planning. In this case, planning implies a set of decisions for future action to meet the manpower requirement of other sectors of stage 2--this planning cannot go beyond stage 3 insofar as its direct influence is concerned; i.e., growth which is the interaction of stage 2. This is because non-formal educational programs will be designed only to meet the requirements of other sectors.

But if we make a plan of the non-formal educational sector as an independent sector of general planning, then non-formal educational activities can influence directly the final stage 4--a stage of social change and development. In such cases, the non-formal educational programs can be planned, keeping in view the sectoral and overall goal of the development plan. It is possible to conceive that this type of planning may influence the direction of social change. Model I and Model II are identical except for stage 4 which has made Model II

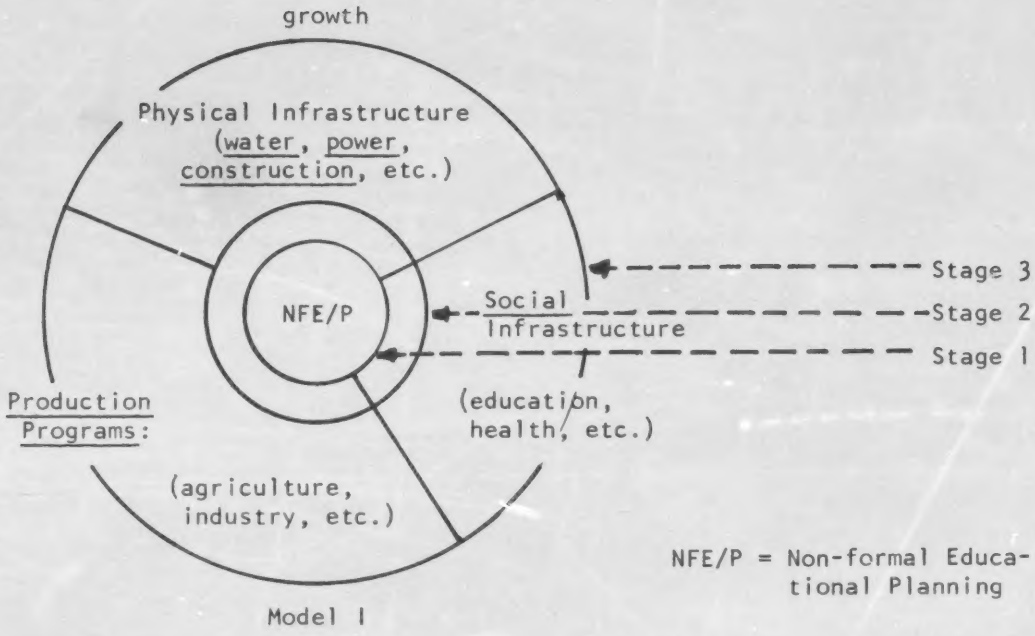

Figure 10A.--Non-formal education seen as dependent sector of national planning.

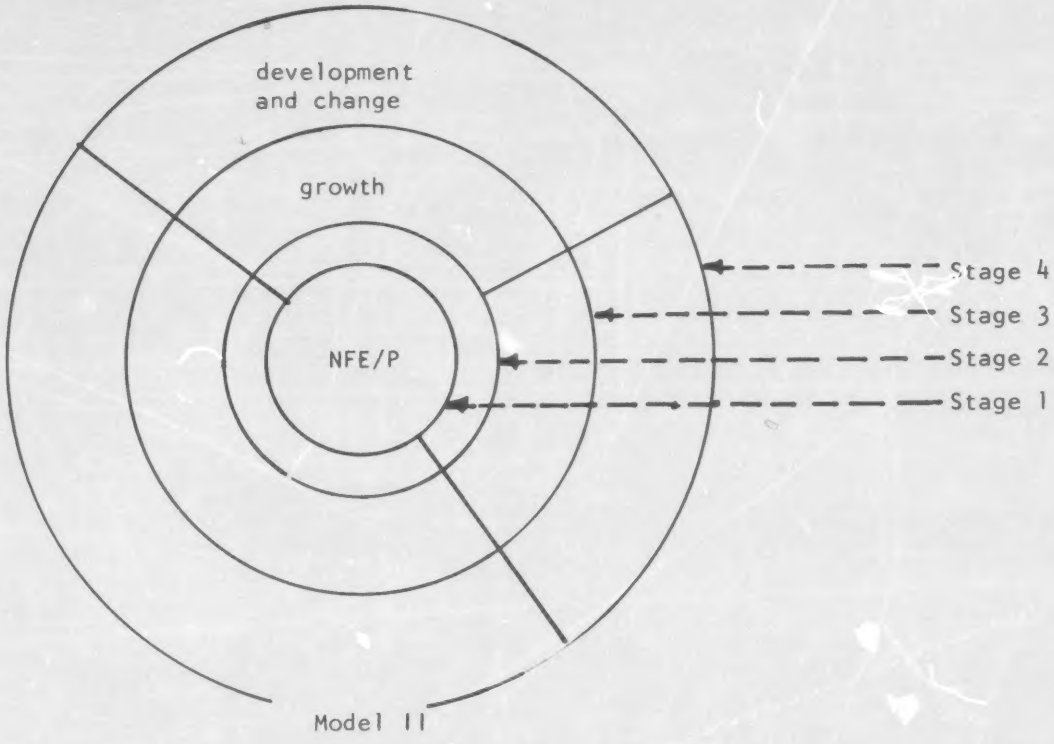

Figure 10B.--Non-formal education seen as independent sector of national planning.

comprehensive and global in character. In the case of Model I, non-formal education can play a passive and indirect role in influencing social change. But in the case of Model II, the non-formal sector planner can act and re-act more actively in the dynamic setting of growth and development. As such, we are inclined to follow the approach suggested by Model II.

Since we have made a distinction between growth and development, we prefer to discuss some implications of non-formal education with regard to growth and development.

Growth and Non-Formal Education

Myint has stated that "balanced growth theory may refer to the minimum *size* of investment programs which are required to start economic development or it may refer to the *path* of economic development and the pattern of investment necessary to keep the different sectors of the economy in a balanced way with each other."[15] He distinguished three related versions of theory: the first version emphasized the consumer's goods industries;[16] the second version the technical indivisibilities in social overhead services in transport, communication power, etc. (e.g., physical infrastructure), and the third version integrated program on industrialization (e.g., the big push).[17] Without entering into the controversy between the balanced growth and unbalanced growth approaches as stressed by Professor Hirschman, there seems to be a consensus among economists, strengthened by experiences in some LDCs where "education is now increasingly regarded as the 'missing component' of economic development."[18] Economic literature has not developed well enough to show as to how to strike a correct balance between investment in man and investment in machine, between social development and economic development. But to determine the scope of "social infrastructure" and its direction is not the job of economists alone; it is essentially the task of social scientists of different disciplines. But there seems to be little or no disagreement that the growing social and economic problem of "educated unemployed" in Asian countries is due to too much of the wrong type of

human investment. Even the case for universal primary education in LDCs is questionable if its high cost and the problems of absorption are taken into account. Viewed from this perspective, investment in non-formal education has advantages over investment in formal education, at least in two ways: *First*, the productivity of investment in non-formal education may be greater due to greater flexibility and adaptability of the social and institutional framework. The strategy of non-formal education can be evolved matching the local situations and needs. This approach to educational investment is likely to stimulate changes and receptiveness to these changes.

Second, non-formal education is perhaps better suited to fill up the gaps of "critical skills" in the context of LDCs.

It is "good" to have an extensive system of formal education. But unfortunately, the resources of the poor countries are too limited to make massive investments in education ignoring the claims of other sectors. At least in the early phases of their development programs, LDCs should concentrate investment on non-formal education and on the objectives of functional education. "These efforts are less time consuming, less costly, and more directly related to manpower requirements than is a formal educational system as such, they are likely to prove most effective in improving the economic quality of human resources."[19]

At this stage, the special characteristics of investment in material capital and investment in human capital are explored. This intuitive distinction may stimulate arguments which may be useful in evolving an appropriate investment strategy. A comparison is shown on the following page.

Physical investment is less complex compared to investment in man. But non-formal education presents perhaps less complexity compared to its counterpart in formal education.

Development, Modernization, and Non-Formal Education

We see a very special role of planning for non-formal education in the context of broader concept of development. For our purpose,

Physical Investment (1)	Investment in Formal Education (2)	Investment in Non-Formal Education (3)
(a) Easy to distinguish between consumption and investment component.	Product carries joint features of consumption and investment.	Same as (2) but in general more job oriented, less consumption.
(b) Characterized either by a long gestation period (e.g., steel mill) or by a short period (e.g., agriculture).	Generally characterized by a gestation period involving 10 to 20 years.	Generally characterized by relatively short period.
(c) Relatively easy to apply investment criteria (e.g., cost-benefit analysis).	Difficult to apply. But the standard procedure is that the value of investment in formal education is to estimate the future stream of incremental earnings accruing to the student and to discount it to obtain the present value.	Difficult to apply. But the standard procedure as stated in (2) is more applicable; very many projects are of very short term in nature. Identifying appropriate control group is much more difficult.
(d) Material capital can usually be scrapped when it becomes too expensive; may have some value.	Wrong investment cannot be scrapped; may be self-perpetuating and disrupting the social infrastructure.	Same as (2) but the scope for disrupting social infrastructure is less because of the nature of the projects.
(e) May or may not be risky.	More risky because change in social dynamics over a long period in addition to the risk of death.	Relatively less risky if time factor is taken into account.
(f) Externalities exist in varying proportions.	Externalities exist in varying degrees between rich and poor country; In the *long run perspective*, external benefits of education which lie in the change in the social and cultural climate may constitute a substantial part of the total gain in LDCs or wrong investment may be a source of social instability.	External social costs and benefit may constitute a substantial part of total gain usually in the short run.
(g) In LDCs, problem of foreign exchange components of costs is a major problem.	The same problem tends to increase from kindergarten to university.	No set pattern; since most of the programs tend to fit local conditions and resources, the problem is less serious compared to the cost problem in formal education.

growth is a part of development. Thus, growth in GNP or per capita income or increase in employment may not be an adequate criterion of development. While advocating a human resource approach to the development of African nations, Harbison, a leading exponent of manpower planning, notes that "education has other broader purposes than human resource development."[20]

We should make a distinction between modernization and development. To me, development is the total cumulative effect of modernization. Modernization is seen here as a process by which social, political, and economic institutions of a given society tend to adapt changing functions and role resulting from change in paradigm. As Professor Black[21] observes: "Modernization may be defined as the process by which historically evolved institutions are adapted to the rapidly changing functions that reflect the unprecedented increase in man's knowledge, permitting control over his environment, that accompanied the scientific revolution." Though it is difficult to endorse all change as positive, yet both advanced and LDCs have accepted modernization in principle as desirable. Education, both formal and non-formal, can play a crucial role in the process of modernization even if economic considerations are the most important criteria in determining the overall degree of modernization in the LDCs. Investment in non-formal education at a macro-level tends to generate the forces of change which are likely to influence the life styles and value systems within a given society. Adam Curle has shown education as a powerful agent of economic and social change.[22] Thus, educational investment has to be understood in the broad social context.

For LDCs, it is high time to understand and fully grasp this broader conception of development. In industrial Western societies, job and job only is the "key to individual status and participation in the good of society," but in the case of new nations which are still traditional, we can perhaps confer social status in a variety of ways. This may give meaning and satisfaction to the people involved. In the light of these social values it is very difficult to recommend

the Western type of development for the new nations without qualification. Many people are raising fundamental issues.

> *Already the wastefulness and resource-hunger of the leading industrialized nations are becoming painfully apparent in the problems of pollution, energy, water and raw materials. Considering that the economic well-being of the industrialized nations has steadily depended upon increasing per-capita consumption that has reached the point where planned obsolescence and fashion changes are essential to maintaining the volume of business, can it seriously be maintained that the road to well-being for the new nations is along this same route?*[23]

Development strategy for the new nations must come in terms of gradual reduction and ultimate elimination of malnutrition, disease, illiteracy, squalor, unemployment, and inequalities.

The mere increase in GNP will not reduce poverty automatically, and serious efforts are required to reduce inequality. "Let us worry about the *content* of GNP even more than its rate of increase."[24] Miller notes the following *four* educational implications of any broader conception of development.

1. Education must be less formal;
2. Education must be freed from system restrictions and be developed through a variety of specific projects on a smaller scale;
3. Educational projects must be recognized as experimental and must be monitored so that we find out what works in specific situations;
4. Education must become more of a service within a complex of development efforts and less of an instructional program for the sake of instruction.[25]

While we are in general agreement with the author with respect to having environmental, experimental, and service oriented non-formal educational programs within a new perspective on development, we are hesitant to accept his contention that less formal educational programs or non-formal educational projects, adjusted to local conditions, may not be confined within the requirement of any national or other widespread systems. Miller seems to neglect the importance of "systems analysis approach" in education either consciously or unconsciously. Non-formal education, fragmented though it may be, must be treated as a part of the total social picture. Non-formal education

must be approached "as a part of a larger system and not as a system which exists of and for itself." This leads us, then, to discuss the following aspects of non-formal educational development planning:

(a) strategy of planning;

(b) manpower development in non-formal educational planning;

(c) systems analysis in non-formal education.

Strategy in Planning Non-Formal Education

Non-formal planning is a continuous process. Regardless of the state of development in a given country, a clear strategy is needed to direct the course of non-formal educational development. There cannot be one strategy for all countries. It may differ from country to country depending on the stage of development. But after making a survey of the literature it seems to us that it might be possible to state a few general principles on the strategy of non-formal educational administration:

(a) principle of need;

(b) principle of consistency;

(c) principle of reciprocity;

(d) principle of efficiency and productivity;

(e) principle of universality.

In the first instance, the social and economic need of any particular community will have a strong bearing on its strategy. Perhaps because of the serious scarcity of resources, LDCs may place heavy emphasis on job-oriented or service-oriented non-formal educational programs. The essential nature of such programs are not only to match education and work, but also to "help people do things for themselves and to assist them in tackling immediate problems of health, sanitation, etc. In the broader framework of development this service-oriented non-formal education means a type of instruction which comes in as specific technical problems are identified. Education then becomes but one auxiliary service for people who are trying to do something for themselves."[26] This type of emphasis may

be needed equally in the case of a rapidly changing technological society such as the U.S. and LDCs. But the dimension of the problems may vary from country to country. In the U.S., for example, training and retraining through non-formal education might seem extremely helpful in making necessary job adjustments.[27] Thus we see that emphasis on non-formal education will depend on "need" of the society.

The second principle is that of consistency. This means not only the internal harmony between objectives and means in achieving the objectives but also external consistency. This question of external harmony arises because education as a sector has a direct bearing on other sectors of the economy. Thus if a company wants to retrain the older people through non-formal education it must take timely action not only to house them and to train the required teachers and to prepare study materials but also ascertain the need of the different sectors of the economy. In this sense, "strategy means liaison and harmonization."[28] In formal education, this act of harmonization is relatively easy compared to non-formal education where it is difficult to offer a clear statement of objectives, especially when we are involved in macro-planning. At the project or program level, the objectives of non-formal education are much clearer and more easily stated and measurable than for formal education. The heterogeneity of the former and apparent homogeneity of the latter make quantification and evaluation of non-formal education much more difficult at the "macro" or consolidated level.

Third, strategy for non-formal education demands the adequate provision--both financial and human--resources for contingencies arising out of the implementation of the program.

Fourth, a strategy of educational planning should also be guided by the objective of efficiency and productivity. The economist's concern for this principle sometimes creates misunderstanding between educators and economists, misunderstanding which summed up succinctly: "Educators believe economists are too materialistic, particularly when economists talk about the efficiency or productivity of education, whereas economists believe educators are too romantic, particularly

when educators ask for more money."[29] When both educators and economists sit together it is not difficult to clarify some of the main issues and misunderstanding. Perhaps nobody will tolerate clear wastage of an educational program arising from duplication or multiplication of efforts, the splitting up of programs into uneconomic size. The strict application of economists' investment criteria (i.e., cost-benefit analysis) in non-formal educational investment may have a doubtful validity. There is definitely a scope for cost analysis (i.e., structure of expenditure, the detailed allocation of funds, etc.) in non-formal educational planning. But it is because of acute shortage of technical personnel, particularly in LDCs, that we do not suggest the introduction of program and performance budgeting instead of conventional item budgets in the area of non-formal education.

Last, but not least, is the principle of universality. This implies that in addition to economic factors wherever possible sociological, political, and anthropological factors should be taken into view in planning for non-formal education. From the viewpoint of development economics, the best strategy means an optimal mix of several factors in planning for non-formal education as a sector. This is likely to ensure political support for the program and the community involvement in such action. This may mean the sacrifice of the principle of efficiency and productivity to some tolerable extent.

Coombs' suggestion of two principal elements of a positive strategy includes focus on interrelationship between the educational system and its environment and stress on educational innovation.[30] He holds the view that the world educational crisis is born of the conjunction of five factors: (a) the student flood, (b) acute resource scarcities, (c) rising costs per student, (d) unsuitability of output, and (e) inertia and inefficiency.

Manpower-Development in Non-Formal Educational Planning

Within the broader concept of development, non-formal education can contribute in a variety of ways. Manpower development, utilization

and maintenance, should be treated as one of the facets of the non-formal educational planning. We have already noted that the scarcity of resources is acute in the case of LDCs, so manpower development through the non-formal education is particularly significant in LDCs. Thus, job-oriented and service-oriented non-formal educational training imply identification of future shortages and surpluses of manpower in each major sector of the economy, and then evolving an appropriate strategy of training and retraining through a system of incentives. Any policy concerning incentives must be treated as an essential component of the strategy of non-formal educational planning. Without provision for incentives or attractiveness of training, it would be difficult to attract the attention of the people involved. This is fundamental to any society based on private enterprise, personal freedom, and democratic ideals.

For the purpose of proper identification of actual manpower needs, a planner requires knowledge of the past, and present, and should be able to see how the future will differ with respect to the occupational structure of the total labor force. There is no hard and fast rule with regard to the method of identification of manpower needs in a given economy. But in the areas of non-formal education we clearly see five distinct problems of manpower analysis in LDCs. They are as follows:

(1) statistical data either unavailable or unreliable;

(2) lack of trained local personnel;

(3) lack of appreciation of the systems analysis approach in education;

(4) unanticipated and non-marginal changes in manpower needs;

(5) lack of recognition of non-formal education as a way of learning.

Although the first four problems can also be related to formal educational planning, the problems are less serious in the case of formal education because it has been fairly well developed in LDCs along similar lines to those in the West. Further, the capacity of the schools, colleges, and universities are known; and objectives

can also be clearly defined. Thus, despite the difficulties, solving the problem of prospective shortages and surpluses becomes comparatively easy in the area of formal education. Thus, in advanced countries, there are several ways one can make manpower forecasts for purposes of ascertaining needs for education.

> *These include asking employers to estimate prospective requirements; extrapolating past trends in the growth of the profession; and correlating the number of employees in the occupation with total employment, population, per-capita or total national income, or some other such variable, using the regression equations thus derived to estimate the total stock of engineers needed as of the forecast date. This quantity is then compared with a forecast of the supply of engineers as of that date, calculated on the basis of the current stock withdrawals, and inflows from existing educational institutions. Prospective shortages or surpluses are thus identified.*[31]

Some of the techniques can be used profitably in forecasting the manpower requirements from non-formal education.

At this stage this manpower requirement approach in non-formal education has to be distinguished from social demand approach. Social demand approach is essentially concerned with the concept of education based on the goal of imparting some measure of education to all its citizens. In LDCs such as India, Pakistan, Bangladesh, and China, this approach is gaining popularity simply because of the fact that the desire for education is constantly increasing. But the problem arises because the available funds for education are becoming relatively scarcer day by day in these countries.[32]

Systems Analysis in Non-Formal Education

The term "systems analysis" has recently been widely used. The method is designed to assist decision makers for long-term perspective planning. The concept has been widely used in defense planning.[33] It is defined as

> *An inquiry to aid a decision maker to choose a course of action by systematically investigating his proper objectives, comparing quantitatively where possible costs, effectiveness and risks associated with the alternative policies or strategies for achieving them, and formulating additional*

alternatives if those examined are found wanting. Systems analysis represents an approach to, or way of looking at, complex problems of choice under certainty.[34]

A systems approach in non-formal education is needed not only for evolving an appropriate strategy, but also for manpower analysis in non-formal educational planning.

Systems analysis in education is essentially concerned with total educational effort in a given society.[35] Non-formal education, a part of the total system of education, cannot and should not ignore the role of schools, universities, technical institutes, and the employing institutions which may provide facilities of training on the job. The main advantages of the systems approach to education are as follows:

1. to get a total picture of demand for education in a given community, thereby enabling the planner for non-formal education to know the magnitude of tasks to be performed by the non-formal educational sector.
2. to know the total supply of educational resources--human and financial.
3. to identify the total "manpower requirements."
4. to identify the total "absorptive capacity" referring to a country's capacity to provide some kind of useful employment for persons with some educational qualifications--formal or non-formal.
5. to establish closer linkages among different human resource development agencies, thereby giving an opportunity for considering alternatives of training programs (e.g., whether pre-employment craft training should be given in a formal technical school or in an employing establishment on the job).
6. to avoid duplication and multiplication of educational efforts so that scarce resources can be used more effectively and efficiently.
7. to detect actual and potential distortion in the system, thereby enabling the planner to consider measures to rectify the distortion.

This systems analysis approach in non-formal education is highly complex. In LDCs this complexity arises partly because of the very nature of the problem, partly because of acute shortages of

skilled personnel in this area and partly because of the lack of information and effective communication as well as paucity of statistical data. Also, when non-formal education becomes "systematic" it tends also to become somehow formal. Despite this, effort should be made to apply systems analysis in non-formal educational planning, because this approach will not only highlight the various areas of concern but also offer different alternatives. This will facilitate the decision-making process and certainly help reduce wastage.[36]

Summary and Conclusions

1. Despite the great diversity of forms, planning implies a conscious effort to exploit the available resources--both human and financial--to attain certain more or less specific objectives. The degree of specificity frequently leaves much to be desired.

2. The current interest in non-formal education is essentially a phenomenon of the 1970s. Any definition of non-formal educational planning must have the following five distinct parts, either implicitly or explicitly:

   (a) a statement of objectives and priorities in the light of the "need";

   (b) a survey of resources both human and financial;

   (c) matching of resources with objectives through technical coefficients;

   (d) implementation of the plan;

   (e) a provision for evaluation and feedback.

3. The educational economist can conceive of two levels, two forms, and two approaches to non-formal education. As for levels, economists can study non-formal education either from a macro-level or from micro-level. As for forms, it may be planning by inducement or by direction. As for approaches, we may treat non-formal education as a sector of overall society or a sub-sector within an education sector.

4. Growth and development are distinctive entities. Education is now increasingly regarded as a vital component of economic growth and development. But investment in non-formal education can have

advantages over investment in formal education at least in two ways: First, it produces greater flexibility and adaptability within the social and institutional framework; second, it is better suited to fill up the gaps of "critical skills" needed for development. These efforts are likely to be "less time consuming and less costly."

5. After making a comparative analysis of the characteristics of investment in formal and in non-formal education, it has been found that investment in man through non-formal education is perhaps less complex. The following aspects of non-formal education have been discussed:

(a) strategy planning;

(b) manpower development in non-formal educational planning;

(c) systems analysis in non-formal education.

As for strategy, we have developed five general principles of strategy as follows:

1. principle of need (i.e., establish need or identify the area of concern);
2. principle of consistency (i.e., internal and external harmony);
3. principle of reciprocity (i.e., making adequate provision for carrying out activities arising out of implementation of the project);
4. principle of efficiency and productivity (i.e., avoidance of wastage and better utilization of resources;
5. principle of universality (i.e., taking into consideration action of sociological, political, and anthropological factors in addition to economic factors wherever possible).

Manpower development, utilization and maintenance, is treated as one of the facets of non-formal education. We find five distinct problems of manpower analysis in LDCs in the area of non-formal education. They are as follows:

1. lack of statistical data;
2. lack of trained native personnel;
3. lack of appreciation of the systems approach in education;

4. uncertainty in ascertaining the manpower need;
5. lack of recognition of non-formal education as a mode of learning.

Lastly, we have seen that systems analysis approach in education is concerned with the total educational effort in a given society. Non-formal education is seen as a vital part of the total system of education. As such, activity in the area of non-formal education must take into account the activities which are going on in formal schools, with a view to get the advantages as follows:

1. to get a total picture of demand for education;
2. to get a total picture of supply of educational resources --human and finaicial;
3. to identify the total manpower requirements;
4. to establish closer linkages;
5. to avoid duplication;
6. to detect actual and potential distortion in the system.

Taken all in all, we see that non-formal education, if properly planned, can play a decisive role in human resource development not only in advanced countries, but also in modernizing economies such as India, Bangladesh, Nigeria, and Brazil. Development experience has shown that most of the plans in LDCs have failed due to inadequate implementation. This is a very important lesson for those concerned with planning the non-formal education sector. Non-formal educational planning is in its infancy, but we see its great prospects and possibilities in the 1970s.

NOTES: CHAPTER V

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3. Albert Waterston, "What Do You Know About Planning?" *International Development Review*, Vol. VII, No. 4 (December, 1965). *Passim.*

4. Waterston, *Development Planning*, *op. cit.*, pp. 6-9.

5. Gerhard Colm and Theodore Geiger, "Country Programming as a Guide to Development," p. 66. Reproduced from Waterston, *Development Planning*, *op. cit.*, p. 7.

6. UNESCO, *Educational Planning: A World Survey of Problems and Prospects* (Paris: UNESCO, 1970), p. 28.

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21. C. E. Black, *The Dynamics of Modernization: A Study in Comparative History* (New York: Harper & Row, 1966), p. 7.

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23. Ralph M. Miller, "The Planning of Development and Its Educational Implications," in *Perspective on Development* (New York: The Agricultural Development Council, Inc., October, 1972, reprint), pp. 8-9.

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25. R. Miller, *op. cit.*, p. 8.

26. *Ibid.*, p. 10.

27. OECD, *Employment of Older Workers* (Paris: OECD, 1967), p. 73.

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33. OECD, *Budgeting, Programme Analysis, and Cost-Effectiveness Analysis in Educational Planning* (Paris: OECD, 1968), p. 33.

34. *Ibid.*, p. 33.

35. Coombs, *op. cit.*, pp. 8-9.

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CHAPTER VI

SUMMARY AND CONCLUSIONS

Trends and Issues in the Economics of Non-Formal Education is simultaneously discrete and continuous. It is "discrete" in the sense that it comprises distinct sections, each of which is intended to be independent of the others with its own objectives and related analysis. It is "continuous" in the sense that all sections together present the reader with an integrated view of the economic aspects of non-formal education.

This is a descriptive analysis in which I have adopted essentially a theoretical and policy approach. The data and sources used are secondary. The underlying hypothesis to be examined is that non-formal education can substitute for and/or complement formal education both in more and less developed countries. Chapter II demonstrates that non-formal education can be an acceptable alternative to formal education. A theoretical framework is developed indicating the problems involved in investment criteria and their application to non-formal education. Finally, the need for strategy of planning the non-formal education sector is discussed.

An Integrated Summary

Non-formal education is here defined as a "conscious" effort to utilize the educational resources (human and financial) usually outside of formal schools to add to the total learning opportunities available in both "consumption" and "capital forming" activities in a given community. The main feature of non-formal education is that learning and work experience are closely related so that motivation is maximized because of the evident link between learning and reward. This is distinguished from learning associated with formal schools. This is also distinguished from pre-school, family learning situations

which may be called "informal" education along with learning associated incidentally with exposure to the physical and social environment.

One group of educators views education as a lifelong, continuous process, and it follows that non-formal and formal education must co-exist. Another school advocates "de-Schooling society" or the abolition of formal education. Schools are said to create social discrimination and inequality, and to require conformity. Economists can view non-formal education either at the macro-level involving the study of the integrated system of non-formal education or at micro-level involving an analysis of individual programs.

Chapter II demonstrates that non-formal education can be an effective alternative to formal education. A number of relationships is considered such as those between education and employment, between demand for and supply of skills both at micro and macro-level. This demonstrates many functions for non-formal education particularly in filling many lacunae which I have chosen to call "gaps." Cross-elasticity of demand is considered which measures the price-quantity relationships between two products, e.g., the relationship of a relative change in the quantity of non-formal education taken to a relative change in the price of formal education. The demand and price relationship between formal and non-formal educational output are explained. The role of non-formal education is considered with respect to nine "gaps" and its capacity to reduce them:

1. the job gap between education and work experience resulting in maximizing motivation (i.e., job gap);
2. the wastage of resources resulting from dropouts by providing alternative institutions of learning (i.e., efficiency gap);
3. the pressure on formal schools thereby helping to improve the quality of education (i.e., demand and supply gap);
4. the pressure on schools so that they can cope with the tremendous growth of school-age population (i.e., population gap);
5. the rate of rural emigration to cities (i.e., wage gap);

6. the social inequality and discrimination in education (i.e., equity gap);
7. the rigidity and bureaucratic arrangement of the schools; the diverse nature of non-formal education programs tends to be more adaptable to educational innovation and change (i.e., adaptability gap);
8. the supervisor's difficulty in assessing individual performance on the job since the worker's skills are likely to outrun supervisor's (i.e., evaluation gap);
9. the expectation gap which is reflected partly in migration from rural to urban areas, and the pursuit of education for jobs which are not readily available (i.e., expectation gap).

Thus the non-formal educational sector, if properly planned, can offer more than an alternative. By its diversity, non-formal education can be a dynamic factor in manpower development, utilization, and maintenance. The economic and social theory of non-formal education developed here is a first step to explain the dynamism of non-formal education in the hope that others may be stimulated to further investigation.

Like the output of formal education, the output of non-formal education is also a complex social product. In both, there exists the difficulty of separating investment from consumption expenditure. But unlike formal schooling, non-formal education does not generally involve a long gestation period since it produces an output which is usually task specific. This makes the analysis a little easier. But the problem of application of investment criteria to education is formidable. The intangibles plague us. But decisions have to be made--both with respect to the allocation of resources and their efficient management. Despite the difficulties, cost-benefit analysis and cost-effective analysis are useful in the sense that they bring an element of objectivity. Costs are relatively simple to handle, but the benefit estimation presents a problem of serious nature.

There is, however, an increasing awareness among economists of the role of non-formal education in human resource development which is defined as the process of increasing knowledge and the "critical skills" of all the people in a society for social and

economic development. But a part of the non-formal education, especially "on-the-job" trainir , is explored in some detail. Machlup identified three types of on-the-job training: (a) on-the-job training from experience, (b) on-the-job training under guidance, and (c) off-the-job training inside the factory. His concept seems to be too narrow because he excludes (a) from on-the-job training. Despite certain limitations, Becker's discussion of on-the-job training (i.e., *general* training useful to firms besides those providing for it and *specific* training intended for the firms providing for it) is very powerful; it may prove to be a critical breakthrough in the development of a useful theory of on-the-job training.

There is additional discussion of rates of return to non-formal education. Little empirical work has been done on this, although several attempts have been made to calculate the rate of return from formal schooling in the U.S. Both Becker and Mincer study rates of return on investment in on-the-job training and provide an innovation in human capital theory by seeking to treat the "useful life" of the investment, as fixed physical assets are treated. There are many imperfections in the procedure such as Mincer's assumption of constant rate of return to investment and, further, his failure to adjust for differences in native ability and home backgrounds in his calculation of comparative rates of return.

The appreciation or application of investment criteria, however difficult, aids in the efficient allocation and management of scarce resources. The final chapter deals with planning. It is linked with the preceding discussion because appropriate investment criteria are extremely important for planners. The planning of the non-formal education sector, a continuous process, is a deliberate attempt to utilize the available resources usually outside of the formal school system in order to achieve certain specific well-defined objectives, to include finally a means of evaluation. For planning purposes, non-formal education is seen as a vital part of the total system of education so that a linkage is established and waste avoided. In other words, planners should adopt the "systems analysis approach" in educational planning.

But sector planning also calls for a strategy of planning which should at least be guided by the following five principles:

1. principle of need (i.e., establish need or identify the areas of concern);
2. principle of consistency (i.e., maintaining a balance between internal and external harmony);
3. principle of reciprocity (i.e., making adequate provision for carrying out activities arising out of implementation of the project);
4. principle of efficiency and productivity (i.e., avoidance of waste and efficient utilization of resources);
5. principle of universality (i.e., taking into consideration of sociological, political, and anthropological factors in addition to economic factors wherever possible).

Major Conclusions and Findings

1. Both economists and educators can view non-formal education at either the macro-level or the micro-level.

2. The appeal of non-formal education is understandably great both in more and less developed countries. This appeal has solid theoretical bases, and the analysis contributes to developing an economic and social theory of non-formal education.

3. The substitutabilities and the complementarities between non-formal and formal education can be explained with the help of cross-elasticity of demand. That is, when non-formal education becomes a close substitute to formal education so far as the salable skill in the job market is concerned, the demand for non-formal education is likely to up with the increase in the price of formal education. Suppose auto mechanics can be trained either in a formal school or in the neighborhood garage, and they are close substitutes for each other. With the *increase* in the wages of formal school mechanics, *ceteris paribus*, fewer will be employed. Then the demand for non-formal education mechanics tends to increase. This increase in demand for non-formal education mechanics will lead to higher wages. In other words, wages to both formal and non-formal education outputs will move in the *same* direction if they are substitutes. The

reverse is the case if they are complementary to each other. If the non-formal education programs become the complementary source of supply of skill in the job market, the demand for non-formal education will increase with the increase in the demand for complementary formal education.

4. If the factory turns into a classroom (instead of the classroom into a factory), a better labor and management relationship may emerge. The laborers will be benefited by the greater opportunities to acquire skills necessary for promotion or higher salary. Management will be benefited by getting more committed labor. This may lead to a lower labor turnover.

5. There are conceptual problems involved in cost and benefit estimation. There seems to be little consensus among economists on certain basic issues such as appropriateness of the interest rate to discount long-term public investment, the length of the observation period, the appropriateness of the control group, and definition of social costs and benefits (i.e., externalities). The problem is further complicated by the fact that non-formal education output is a complex social product. Cost-benefit analysis, however, provides an element of objectivity in the decision-making process.

6. In the case of formal schooling, earning and learning do *not* usually go together, and the income stream is *negative* during the years of schooling as a result of forgone income, and tends to be positive during the periods of earning. In the case of non-formal education, learning and earning may generally *go together*. In some cases, learning becomes unavoidable involving *no* marginal costs. Even in the case of off-the-job training or on-the-job training (general and specific), earning and learning can conceivably go together, and the income stream may be positive. This is a significant difference.

7. The differences between the general and specific training on the job are already explained. The firms may be encouraged to draw up a general training through fiscal and monetary incentives, as the

expenditure on such training (whether or not they are actually borne by the labor force) generates economies external to the firm.

8. Unlike a dam or steel mill, it is hardly possible to calculate the rate of financial return on a non-formal educational project because of the difficulty of separating social, cultural, political, and economic aspects of the non-formal educational product. But if the objectives of a program are defined (if possible, in behavioral terms) and priorities determined, at least the first requisite for computing the rate of return from investment in non-formal education has been met.

9. A plan of the non-formal educational sector may be evolved by a relatively small group of well trained and experienced scholars, but its implementation may require the active involvement of the whole public and private sector as well as other social and economic institutions. Implementation must be seen as an integral part of the planning process.

10. The investment in man through non-formal education presents less complexity compared to its counterpart in formal education in that its objectives are more specific and narrower, thus, increasing the likelihood of meaningful evaluation and measurement.

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